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Semiotic machines

Software in discourse

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Abstract

As media have become digitised, processes of communication previously characterised by human interaction are now automated while inter-personal communication routinely takes place through images, sounds, music, code and language (multimodality). This study develops new theoretical and methodological approaches to the study of software as a medium of communication.

Software as communication medium provides specialised semiotic resources for producing, processing, distributing, sequencing and storing messages. Software is a procedural representation which delegates certain aspects of human semiotic work to automated processes or quasi-semiosis. In this, it is unlike traditional media and semiotic modes such as images, speech, and writing.

This study analyses voting software, educational software, search engines, and combat and narrative in digital games. In each case it investigates how proprietary software affords discourse, and suggests a way of characterising users' experience of this discourse. These affordances constitute the rules of communication, or 'rules of speaking', 'rules of seeing', and 'writing-rights' which proprietary software makes available to users, situating them within specific power-relations in the process.

In a global context of unequal access to resources, software's affordances are not available to everyone in the same way. The study develops methodologies for a multimodal discourse analysis of the activities of two groups of software users, namely primary school children in Athlone, South Africa, and two guilds of online gamers who play World of Warcraft on a European server. A comparison of the use of software in these contexts suggests the importance of the situation of use, as well as the social power of the procedural mode. Software users respond to situationally specific 'rules of communication'. These include the rule-governed simulated discourse encoded by a procedural genre of software and the rule-generating shifting interpretive frames, social norms and discursive conventions of the context within which software use takes place.

Media production and reception circuits in proprietary software are theorised in terms of user, channel, and owner circuits, with their associated relations of clientship. New text-making resources include automated transduction, variable cohesion, and software's mediated action, effects and artefacts.

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Chapter 1: Introduction

Over the past few decades, changes in media technologies and consumption practices have shaken the foundations of the traditional media industries. New digital production and networked distribution methods have spawned highly profitable 'new media' industries. Recently, as a critical mass of consumers have chosen to go online in developed countries, traditional media and public relations industries have struggled to incorporate the 'participatory media' associated with social networking software, blogging, and other 'conversational' genres. This study presents some examples of the global variation in participatory practices evident in different parts of the world as mass media, interpersonal communication and software applications converge.

Information and communication technologies utilise the affordances of informational code as resources for sign-making. This study theorises the key aspects of these new processes of sign-making and explains how they relate to human semiosis, or meaning-making. I illustrate these theoretical contributions through contextualised analyses of specific genres of software in use.

In contemporary theories of social semiotics, technology's role in the semiotic process is acknowledged (e.g. Kress, 2003; Van Leeuwen, 2005; Jewitt, 2006). Technologies of representation such as print, television or the Internet facilitate or favour certain kinds of meaning-making and also differentiate between people, by allowing and barring access to the means of production and reception (Kress and Van Leeuwen, 1996:223; Jewitt, 2006:12). To date, theorists in social semiotics have focused primarily on 'multimodality', or the simultaneous use of different semiotic modes such as images and sounds to communicate. Some of the key affordances of digital media and software as vehicles of multimodal communication have not yet been adequately explained. This study contributes to the understanding of how people use digital media technologies and software in sign-making activities by bringing together insights from the ethnography of communication, social semiotics, human-computer interaction and game studies.

Through situated analysis of case studies of software in use this study generates the new theoretical and methodological approaches needed to undertake the study of software as a medium of communication. Software has a dual function of both

simulating and mediating action while allowing users access to a range of applications, or distinct genres of multimodal discourse. This suggests the following questions for investigation:

- What software-based simulations are chosen by participants to represent the world and to mediate their social interactions?
- How do the actions simulated by software systems enact social power through the mediated discourses they afford to users?
- How do different participants use the software and what significance do they attribute to it?
- What are the social meanings of automation in discourse?
- How are the systems used in allocating resources, and simulating the social power and identity of participants in a specific social context?
- How do differences in use play out in relation to local and global power relations?
- What are the social meanings of differences in participation rights and physical access to computers, networks, and digital media?

All of these questions can only be answered by studying a software application in use in a specific, well-understood social context. For this reason, I selected research sites which are well known to me, where I was able to develop a contextual knowledge of participants and their interactions by acting as participant observer over a number of months.

In order to identify common features which characterise software use across diverse contexts, and in the interest of developing analytical tools which are applicable across research sites, I selected two very different social situations for analysis. While they are not to be considered 'representative' of the diversity of software use in any way, they were selected so that theory could be generated from the experiences of the impoverished South as well as the wealthy North, and from applications which support formal institutional activity as well as informal leisure interaction. In addition, it was important that the model of software as mediated discourse should be able to explain both the virtual and the embodied interactions between participants.

In selecting these sites for study, I was wary of the tendency to develop theories from data collected only about the 'state of the art' or newly fashionable technologies, or to generalise the social activities of a wealthy elite and then to assume that these apply to the rest of the world as well. For this reason, I juxtaposed a study of children using computers in an impoverished state school in South Africa with the online leisure

activities of wealthier young people, known as “Generation Y” in Europe. (Generation Y is marketing jargon for the generation of young people who have grown up with digital technology around them, and who are variously defined as anything from 5-31 years old [Perez, 2008].) In particular, the study emphasizes the diversity of the group referred to as ‘Generation Y’ and acknowledges the massive global inequalities in their access to technology and digital media without resorting to simplistic binary notions such as the ‘digital divide’. When marketers (or educators) speak in generalised terms about this group, they ignore significant differences which arise from the widely divergent social contexts in which young people are raised, the distinctiveness of educational and leisure experiences in different contexts, and huge global inequalities in access to resources.

In the first research site, I observed young children from Athlone, a township in Cape Town, South Africa, who were using computers for highly structured school lessons for about an hour per week. The children shared computers, and had very limited time to explore anything beyond the lessons they were completing. The second research site was not a physical location, but rather an online community of gamers. Within this community, I studied two guilds of players from a popular online game, World of Warcraft. These players were a group of young friends, most of whom were in their late teens and early twenties and lived in Europe, although a some of them (including myself) came from other parts of the world. Unlike the school children in Athlone, the lives of the World of Warcraft players had come to encompass online interaction as a central part of their everyday activities. This study aims to represent something of the complexity of both contexts, in order to suggest the powerfully situational meanings of software use, and to highlight the different meanings of software use for the two groups.

Both the school-children and gamers used proprietary software which structured their interactions in certain specific ways through simulated discourse structures. In both contexts, systems of numerical representation played a crucial (although not always visible) role – particularly as semiotic resources for competitive self-representation. These numerical representations were used in the adjudication of discursive conflict, and the power differential that this produced encouraged attempts to ‘game the system’.

The economic features of the software exerted a powerful shaping influence on activities in both contexts. Nonetheless, detailed multimodal conversational analysis of recorded interactions shows that the coded functions of the software did not

wholly determine the patterns of behaviour – instead, the children and the gamers used the software as semiotic resources and deployed them strategically within local discourses. In one case, the puzzle-like patterns of educational software were marshalled for the teacher's classroom discourse, while the children 'gamed' these structures in a way that suited their own more playful interests.

In the online game, the hierarchical and competitive structures emphasised by the game design were downplayed by one guild, who called themselves 'The Tribe'. Rather than focusing only on combat and questing in the game, they emphasised the resources which allowed narrative and dramatic role-playing across a range of channels, of which the game was only one. The other guild called themselves (with some irony) the 'The Girl Guides'. They preferred a 'Player versus Player' style of combat in their gameplay, and used game resources for entirely different kinds of interaction. Their activities centred on the procedural discourse of combat, numerical self-representation and the masculine verbal conflict or insult game. In other respects, adapted meanings and uses of the software prevailed, reflecting the encoded practices and interests of the software producers.

As the importance of the physical location diminishes, access to information spaces, or channels, become powerful indicators of privilege and power. As Zuboff pointed out about the use of early database systems in the 1980s, 'access rules become the functional equivalent of organization structures' Zuboff's studies showed access rules either mirrored organizational hierarchies or helped to redistribute authority by providing universal access (Zuboff, 1988:357). In the Cape Town school labs, time in the computer labs was a highly prized commodity, and children were excluded from computer activities because of poor behaviour, or for not paying school fees, and had little or no access to more creative and productive uses of software. More traditional classroom literacy practices, utilising pencil, paper and writing-connected activities, particularly the practice of transcription, were also employed in the lab. In World of Warcraft, players were far more prolific in their media production than the school children, but their elaborate and skilled productions were considered disposable by the game system. These players took computer and Internet access for granted, but social practices of inclusion and exclusion marked their access to guilds and game channels. Player narratives and communities extended beyond official game channels and were made available to different configurations of their audience.

This study investigates the use of software in generating and automating the cohesive structures that provide procedural simulations or 'rules of communication' for simulated discourse. Software's mediating role includes the production of mediated actions, which compute the outcome of user actions, and software effects and artefacts, which represent and record these actions. Multimodal discourse analysis and virtual ethnography are used to analyse how these distinctive features of software are used to simulate and adjudicate discursive conflict. Coded discourse structures that centre on a numerical contest provide an important frame of interaction and interpretation in both the contexts that I studied. The commercial software and its in-built economies shaped local practices and introduced new participants to local discourses. Ultimately, however, the procedural resources of the software are deployed within a particular situated context, which gives them their meaning.

Doing things with software

Using software, people delegate certain interpretive and performative responsibilities to automated intermediaries. Peirce observed that some of the earliest predecessors of computers, such as the Jacquard loom and Babbage's analytical engine, operated by means of 'quasi-signs' which transformed input into output in programmed ways (Nöth, 2002). These machines, like current computers, could not draw on their own experience to produce original interpretations, but they were 'logical machines' and could be deputised to perform certain kinds of logical operations, and to undertake certain reproductive and mechanistic transformations – actions which, as Peirce pointed out, are also part of human semiotic activity (Nöth, 2002). These functions delegate the semiotic authority for certain types of communicative acts from the designer to software procedures. As De Souza (2005) points out, in this regard, software's quasi-semiosis functions as the 'designer's deputy' in communication with the user.

Austin ([1962] 1998) established the concept of the 'speech act' or 'communicative act' in linguistics. His idea that speech is itself a form of action emphasises that we 'do things' with language. This insight established that referential meaning was only one aspect of communication, and that, in fact, all speech is an illocutionary act – 'to say something is to do something' (Austin, [1962]1998:7). Speakers mean to do something when they speak, and these intentions are referred to as the 'illocutionary force' of their utterances. The social reception, or interpretation of a statement, is its 'perlocutionary force' – what the speech act in fact achieves (Austin, [1962]1998:11). When viewed from this perspective, meaningful conversations are interactive

collaborations. Conversation and discourse analysis has continued the analysis of how meaning is negotiated. Individuals contribute to the conversation when their conversational move is taken up by their interlocutor, in a successful joint action (Schegloff and Sacks, 1973; Clark and Schaefer, 1989). In bridging the gap between one person's intention and another's interpretation lies the work of semiosis, and also of social power.

Just as people 'do things' with words, so they also 'do things' with software, which can be defined as a form of mediated action (Dourish, 2004: 203). Algorithms, when implemented in software and executed, allow a more direct form of social action than the deferred forms of action more usual in language. While computers can be controlled to act on the world (such as, for example, in manufacturing and warfare), most often people use them to act in the world by creating media. Aarseth (1997), showed that 'cybertexts' such as adventure games, and textual-based multi-user environments were not only sequences of signs but also behaved like machines or sign-generators. In this study I use the term *mediated action* to refer to the procedurally encoded effect of using software. I distinguish this from the *perlocutionary act* or how people understand or interpret the software's mediated action, and the mediated *effects* and *software artefacts* which are created through the interaction.

What semiotic models are there to explain how action is mediated? Several authors have discussed the processes of semiosis unique to computer systems, notably Andersen (1990) and the Semiotics-Engineering Research Group (SERG), in particular De Souza (2005). For Andersen, interaction with a computer is a form of 'pseudo-discourse' between the computer and the user. De Souza (2005:253) views computers as a *medium* for communicative exchanges between software designers and users, between more than one user, or between programs. Designer and user are interlocutors in a communication process mediated by the 'designer's deputy' of images, words, and behaviour (De Souza, 2005:24). The designer communicates with the user, but the user has limited or non-existent opportunities to communicate with the designer. The asymmetry of this discourse is moderated by user-centred design processes, which are used to understand certain potential users'.

Like other meaningful conversations, the meaning of software use is a joint action, although the power to define significance is unevenly distributed between the designer and user. On the one hand, users have the upper hand in determining the contextual significance and function of their software use. On the other hand, as

De Souza (2005:175) points out, the system's encoded functionality can be very distant from software users' intentions when they initiate an interaction. There can be a vast difference between what software users wish to achieve (or their illocutionary acts) and what in fact happens (the mediated action) as a result of using some function in a software application .

A small number of performative verbs exist in language. When uttered under the right circumstances by a person with the correct social authority, these verbs change social and legal realities, turning a 'single' person into a 'married' one, and turning someone presumed 'innocent' into someone declared 'guilty'. We could say that all software is a semiotic performative – software as sign has a meaning which includes the effect it has on a machine. Unlike perlocutionary acts, which interpret another communicative act, and which are themselves subject to interpretation in the flow of discourse, the mediated action of software is rule-governed, and the user's interpretation cannot change the flow of the program. To change the procedures which generate mediated action in software, we need to change the source code from which it is generated.

This imbalance suggests that patterns of automation have social meanings. This study investigates the social beliefs about what kinds of interpretation can be delegated to machines in specific contexts, and what semiotic actions are appropriately automated. Finally, it also addresses the question of who benefits from the efficiencies created by such automation.

While digital sign-making has reshaped the semiotic landscape, nothing fundamental has changed about how human beings make and interpret signs. Interpretation involves making a new sign from the signifier received from someone else:

When as a reader I see a word, a phrase, a genre, I say to myself, 'I have encountered this before and it has meant these things; it is likely to mean something broadly in that same range (Kress, 2003:38-9).

Like other signs then, software has meaning when it is used in a particular situated context. This study investigates specific situated practices of social communication in order to read how the affordances of the digital medium and specific social interests are shaping innovations in digital sign-making. This study has found that software's 'rules of speaking' and its encoded patterns and 'channels' of mediated communication are given specific local significance within interpretive frames

created by other conversations, discourses and patterns of social power. Enfolded within a particular social context (not necessarily a physical space), software nonetheless shapes discourse by making certain affordances, constraints and relationships differentially available to participants in a particular interaction. In this first chapter, I outline some of the key theories of social semiotics and multimodality which can illuminate sign-making with software.

As the study is intended to be a cross-disciplinary contribution, I have provided examples of important theoretical concepts rather than assuming that the reader will be familiar with them. In this chapter, the examples I have chosen illustrate the complex semiotic activities associated with making a deceptively simple social mark – a voter's action of marking a ballot in an election. A range of examples are chosen in order to illustrate the difference between sign-making in interpersonal discourse and the very different set of semiotic resources and activities which come into play when actions are mediated by software. Given that my interest is in both the affordances and the constraints of software, it seems particularly appropriate to begin the discussion with a case where software was *not* used at all.

‘We can’t see what the computer is doing’

The materials of computing are the tersest of markings, stored by the billions in computer hardware.... Marks on clay or paper, in DNA and in computer memories are equally powerful in their ability to represent, but the only intrinsic meaning of a mark is that it is there (Kay, [1984]1999:129).

Binary or informational code is a ‘new type of alphabet’- the two distinct signals of a ‘mechanically effective notation system’, providing two letters which can be made to mean anything (Finneman 1999:142). The letters of the binary alphabet are imperceptible, and must be mediated by an interface (hardware and software) before the symbols they encode can be perceived. Digital code may be invisible, but it mediates action to make things happen. Software is thus highly specialised for ‘teleaction’ (Manovich, 2001), or ‘control at a distance’, the root of Wiener’s neologism ‘cybernetics’. This power to act autonomously, but invisibly, is a particularly potent combination. The following events from South Africa’s recent political history illustrate the importance of some of the social and political consequences of the nature of digital representation.

A tussle for leadership of the African National Congress (ANC) dominated South African politics in 2006 and 2007, and culminated in the party's national conference in Polokwane (16-20 December, 2007), where South Africa's President, Thabo Mbeki, and former Deputy President, Jacob Zuma, were both nominated for the position of president of the organisation. The election was highly charged, and at one stage, an altercation over a system of computerised voting took centre stage. The editor of a local weekly newspaper suggested that the altercation about methods of counting votes signified 'an assertion of power by a grassroots baying for change' (Haffajee, 2007). This opposition between 'grassroots' power and computers, and popular (or populist) suspicions of the internal workings of a computerised system raises several interesting questions about software, power, and the meaning of digital media in the South African context.

The proceedings at the national conference were brought to a halt when the African National Congress Youth League, who supported Jacob Zuma, brought a motion to disallow computerised counting of votes, demanding a manual count, on the grounds that the computerised system could too easily be manipulated (Lund, 2007). When asked to explain the argument against computerised counting, a delegate from Kwa-Zulu-Natal simply said 'The ANC has always had a history of transparency'. According to these delegates, then, something was not 'transparent' about counting by computer (Wolmarans, 2007). A rumour of a biased voting system had been spread by SMS to delegates' cellphones, and delegates from the Youth League apparently feared that Mbeki and his supporters, who had greater access to the resources of government, could use the automated vote-counting system to skew the results in their favour (much as Mbeki was claimed to have used the state-dominated public broadcaster during his term of office). The unknown ownership of the company which provided the vote-counting software spawned a cloud of rumours. The SMS messages claimed that the vote-counting program had been supplied by a company chaired by former government communications director-general Andile Ngcaba, and that he had ensured that the program was manipulated to Mbeki's advantage (Monare, 2007). The cellphone conspiracy theory was spurred on by the fact that the company which provided the counting software had only been set up three weeks before the conference. The company denied being involved in any such vote-rigging, but eventually, the software was not used at all.

This incident suggests the complex contextual meanings of software as a medium. It is highly ironic that computing is depicted as the enemy of democracy by the Youth League – particularly since this organization includes the generation whose cohorts in

wealthier societies such as the United States, are widely touted as 'digital natives' – those who have grown up with digital technology such as video games, the Internet, and cellphones (Prensky, 2001).

Patterns of access to information and communication technologies are significantly different in South Africa, and this incident shows in the first place that differential access and power to control technology and digital media is a crucial situated meaning of technology. In the second place, the Youth League's difficulties with the 'transparency' of the voting procedure suggests an awareness of what Zuboff has termed the 'problem of meaning' in software (1988:95).

What were the specific contextual meanings that led to the rejection of the voting system? Some media reports suggested at the time that the Youth League (who in fact include members from 14 to 35 years of age) were a group of illiterate luddites or yokels whose actions and statements revealed a laughable ignorance about technology. In fact, this same group participated enthusiastically in a 'war' of text messages which were circulated by cellphones before and during the conference. They chose to use a powerful and viral channel of digital communication that goes under the radar of official media outlets, and yet still exerts a significant influence. These tactics are known as 'smart mob' tactics, where mobile media and computer networks are used in collective actions, such as those which have characterised citizen revolts on the streets of Seattle, Manila, and Caracas (Rheingold, 2002).

In this context then, the 'smart mob' rejected a certain kind of digital technology, and it is worth exploring why. The distance between many South Africans and a global elite computer culture is suggested by a poem published in a local weekly newspaper soon after the conference, entitled 'We can't see what the computer is doing'. One of the lines from the poem reads as follows:

We want transparency. ... A manual government without the mouse-
clicks the smoke and mirrors (our poverty in pie charts) (Kapp, 2007:24).

As the poem suggests, the distrust of certain types of digital representation has a particular resonance with many South Africans' experience of an uncaring, technicist mode of government. There was a particularly significant symbolic value to the gesture of rejection, the Zuma camp were responding strategically to the voting system's power to conceal and control, which they believed had been stacked

against them. The conspiracy theories of Polokwane aside, popular suspicion of a computerised voting system is worth taking seriously for a couple of reasons.

Voters around the world have expressed concerns about automated vote-counting – notably in the U.S. after the introduction of fully automated systems (which were, ironically, introduced in order to avoid the kinds of controversies about vote-counting which took place after the Florida elections of 2000). Critics of such software point out that voting software is a ‘black box’ within a system which should be designed for transparency and public trust. Even software experts can only audit the election process by inspecting the source code from which the software is generated (Kohno et al., 2004, Rubin, 2006).

The problem of whether voters can trust an automated system is just one example of what Zuboff has labelled ‘the problem of meaning’ in computers, or the uncertainty that goes along with the mediating action of software. The user is always at a remove from the data, which is ‘screened’ by the interface, leaving a nagging sense of uncertainty about certain operations – ‘perhaps it happened; perhaps it didn’t.’ (Zuboff, 1988:81).

Between 1981 and 1986, Zuboff (1988) studied the transition from traditional work practices to computer-based systems in eight different organizations, including two paper mills. Her study documents how operators, managers, and clerks at the paper mills watched their workplaces being reshaped around new information systems in the 1980s. She analyses the anxieties about computer-mediated work as an example of the intense awareness of mediation which always accompanies the social introduction of a new medium. On the one hand, the operators in the paper mill were acutely aware of the problematic lack of fit between digital mediation and the ‘concrete world’, since the physical production plant which had formerly been subject to direct physical controls was now governed by information systems. The operators had formerly been able to touch, smell, feel, and control their systems directly, and their trusted sources of information were laid out before them in the actual operations of the plant. In contrast to this embodied knowledge, the mediated systems provided only a ‘slender sense of certainty’ which was undermined by the operators’ awareness that the data they relied on was now ‘prey to a hundred invisible dependencies’ that they did not fully understand –incorrect algorithms, faulty circuits, and human error from the programmers (Zuboff, 1988:81). The operators had to learn to trust this system. Any uncertainty on their part was interpreted as ‘primitive thinking’, a lack of willingness to learn, or simple

recalcitrance. Zuboff argues that they had in fact recognised a fundamental principle, that 'the relation between data and reality is a matter for inquiry, inherently problematic' (Zuboff, 1988:80, 89).

The rejection of computerised voting software suggests at least two dimensions in which computer systems are given meaning, or two important interpretive frames. First, the way in which computers are used, who uses them, and for what purposes creates local and situated experiences, meanings and associations, which people activate when they make decisions about using computers (or operating systems, software packages, interface add-ons and so on). Similarly, the use of a computer system, (or, in this case, the rejection of 'computers') is used rhetorically to signify a particular identity and relationships to other people. In this specific South African context, computing seems to carry the indexical associations of a stand-offish and elitist brand of government, commerce, and administration. In this it is similar to other signifiers of elite status, which people may aspire to, but which they feel ambivalence about, and which they may use to suggest distancing, exclusivity, and a rejection of local values, such as an exclusive use of English in preference to indigenous or local languages.

Second, some of the delegates to the conference responded to the actual affordances and constraints of the voting system. They seemed to perceive the 'problem of meaning' in computer systems in a similar way to the operators from Zuboff's study and the critics of automated voting in the U.S (e.g. Kohno et al., 2004). These delegates distrusted the fidelity of the simulation in the voting system, and saw it as a computational medium of communication whose meanings were closed to them, and personified it by associating it with a distrusted member of the opposing camp.

Understanding the implications of the conflict over the voting software is not only important because we want software vendors to be able to do a better public relations job, or try to address the complex problem of transparency and public auditing of the voting systems they design. The contest about the use of the automated vote-counting at the conference suggests the powerful social resonances of computing systems. In this case, these social meanings were just as important as any of the technical specifications or designed functionality of the system. This study argues that it is important to understand and document how such meanings come into play, and to analyse to what extent they are associated with the design and social functions of the software systems. In cases (unlike this one)

where the systems are actually used, it is crucial to understand these designs and to see them in use. As will be argued below, the systems are deployed as actors that have been delegated to act in specific ways in society.

When systems are trusted to count votes, or to assist in the education of children, or to mediate people's social networks and leisure time, it is worth understanding what processes and relationships these systems simulate. We should also understand whose interests are served by the simulations, and what people make of the simulations when they encounter them. Social semiotics has been used to analyse both interpersonal and mediated interactions to draw out their social significance. This project extends that theory to account for the types of contextual meanings and new forms of mediated action that are associated with software systems.

Social semiotics

Semiotics, also called semiology, is the study of signs and sign systems. The term 'semiosis' refers to the action of the sign, or the process of signification, and was first used by Peirce.¹ According to Peirce, meanings are mental signs or interpretations (which he called the 'interpretant') that are generated in the process of establishing or perceiving relationships between a sign (or 'representamen') and its referent (which he calls the 'object') ([1903] 1998):272-3). Thus semiosis is a dynamic and endless or infinite process, since each sign generates other signs in the process of interpretation. Importantly for this project, Peirce's model implies that meaning is generated by making connections between the situation of communication (which is discussed in more detail below) and a sign, which is both part of, and also helps to shape that context.

Social semiotics emphasises people's active role as sign-makers, or agents who use semiotic resources to create meaning in a particular social context. Other traditions (notably those associated with the work of Ferdinand de Saussure) tend to emphasise the power of 'codes', or languages, which tie signifiers to signifieds, and thus regulate a stable and unchanging regime of meaning (Jewitt, 2006:17). While Saussurean semiotics sees the physical sign (signifier) and its meaning (signified) as a unity, social semiotics follows the Peircean tradition which emphasises the role of interpretation. In social semiotics, interpretation is also seen as a form of sign production. As Jewitt explains, in making signs 'a person (sign maker) brings together a semiotic resource (a signifier) with a meaning (the signified) that they want to express' (2006:17-8).

¹ Peirce in fact used the term *semeiosis* (1982:xxxii)

For example, a social semiotic analysis would note how the word 'transparency' was chosen for specific rhetorical purposes at the Polokwane conference. Traditionally within the ANC, the word 'transparency' is used metaphorically to refer to an organisational principle of openness and access to decision-making. The delegate quoted above used this association as a resource for making a new meaning. His sentence draws attention to the fact that the computerised voting system is not open to inspection, and that it would hide the actual process of counting. The result of this use of the word suggests a veiled accusation that the leadership is departing from the organisation's democratic traditions.

Semiotic resources

In social semiotics, 'semiotic resources' are defined as 'the actions and artefacts we use to communicate, whether they are produced physiologically . . . or by means of technologies' (Van Leeuwen, 2005:3). The term 'resource' is used instead of 'sign' in order to acknowledge that what a sign stands for is not pre-given, and can be affected by the way in which it is used. Resources, or signifiers, thus have semiotic potential based on their past and potential uses (Van Leeuwen, 2005:3). The term sign is used more narrowly in social semiotics, than in the Saussurean tradition. In social semiotics, 'sign' refers to a particular instance of the use of a semiotic resource for communicative purposes [Van Leeuwen, 2005:285].

The concept 'affordance' is borrowed from the ecological psychology of Gibson (1979), who studied perception as a relationship between organisms and their environment, and used the term to designate the 'potential uses' of an object. Van Leeuwen points out that Gibson's use of the term can be compared to the Hallidayan notion of the 'signifying potential' of signs in general. Although physical objects have objective physical qualities, these only become affordances in relation to a particular organism. In other words, the physical qualities of an environment are not useful unless they are perceived, and the semiotic qualities of a medium need to be understood, or they cannot be recruited for action (Van Leeuwen, 2005:3-4). For example, the physical affordances of a paper ballot are different to those of a digital ballot, the one allowing for ease of public scrutiny, the other for efficiencies of processing. The physical layout of the booth regulates the proxemic relations between people, and thus affords a secret ballot – no one should be able to connect a specific ballot to a specific voter.

While the social semiotic perspective does not support the idea of fixed 'codes', this does not suggest that meanings are generated free from constraints, or that sign-makers can depart from all conventions and still be understood as they intend. In fact, the use of semiotic resources is carefully controlled, although in some cases it is more closely watched and precisely governed than in others (Van Leeuwen, 2005:4). Social semiotics developed from the structural functionalist linguistics of Halliday (e.g. 1978, 1985). Within this approach, language and other semiotic systems are understood as social behaviour rather than as purely psychological phenomena. According to Halliday, the grammar and lexis of language exist in order to allow people to interact with one another in society. Language has consequently evolved around three important social functions, or semiotic 'metafunctions', which together characterise all semiotic interactions. Kress and Van Leeuwen (1996) established that these communicative functions extend beyond verbal language to other human semiotic systems such as images and sound. These specialised functions have shaped all existing semiotic resources:

Every sign simultaneously tells us something about 'the world' (*ideational* meaning), positions us in relation to someone or something (*interpersonal* meaning) and produces a structured text (*textual* meaning) (Jewitt, 2006:18).

The metafunctions help to describe the 'meaning potential' of a set of modal resources, that is 'what can be meant' or 'what can be done' (Jewitt, 2006:19) with resources such as written and spoken language (Halliday, 1978), visual communication (Kress and van Leeuwen, 1996), or sound (van Leeuwen, 1999).

In the *ideational* function of language, the speaker is the 'observer' representing the world. The *interpersonal* function is there to represent the speaker's relation to the world and to other people. Here speakers use language to act on the world. (This involves representing their own relationships and interactions with other people, especially those involved in the communicational interaction.) Finally, the speaker uses language to create 'text', or realise meaning by making connections between different signifiers, and creating cohesive and coherent discourse (*textual* function). This is done primarily by using signs which provide guidance on how to relate the message to 'the context, to the situation and the preceding text' (Halliday, 1978:48).

Contextual meanings

Linguistic researchers need to attend to context if they are interested in meaning. This study draws on work in the anthropology of communication, notably Hymes, who saw the importance of studying language as 'situated in the flux and pattern of communicative events' (1974:5) rather than as a set of abstract rules or grammars. For Hymes, eight separate components of the situation are important: the setting and scene, participants, their ends, or goals, the sequence of speech acts, the key or tone of the interaction, its instrumentalities or the channels and register that are used, the norms or rules that are applied, and the genres of speech or writing in use (1974:54-62). The norms which govern communication in a particular situation are particularly important, in that people use them to determine and negotiate what speech acts are suitable, or indeed, constitute, particular forms of social interaction. Hymes (1974:59) also suggests that a participant in a communicative interaction can only interpret an utterance if they have a sense of what 'frame' is being given to the interaction by participants – for example, if a group of delegates to the ANC conference are singing struggle songs (a genre of songs associated with the struggle against apartheid) is it a joyful celebration of freedom, an angry protest, or threat of violence? Thus the relationships between participants help to signify what frame is relevant, and by signalling or cueing which frames are relevant, participants can interpret a particular interaction as a familiar activity within their experience.

The context thus helps people to form hypotheses about, relate to, and interpret what others are saying. Hymes' notion of communicative norms, or 'rules of speaking' may suggest an overly rigid framework of social appropriateness, but it is particularly helpful in explaining procedural representation and software's entirely rule-governed simulation of certain types of social interaction.

Halliday connected aspects of the speech situation to specific dimensions of meaning in language (1985:12). Here, for example, one could analyse President Mbeki's speech at the ANC national conference as a speech about the state of the nation and the ruling party (the field, or kind of social action). It was also a formal speech act governed by particular 'rules of speaking' (the president speaks while everyone else in the venue listens in silence) which took the form of a presidential address (a speech act which suggests a particular 'tenor' or set of roles and relationships between participants) from the president to about 4000 delegates (tenor) at the national conference of the governing party in South Africa. The speech was read aloud in English for two and a half hours from a 42 page written document

and mediated via the public address system in the venue and the national media (this is the channel for communication, or the 'mode').

As suggested by this account, the models developed by Hymes (1974) and Halliday (1985) can provide a useful and nuanced depiction of a communicative situation. Nonetheless, they are somewhat static descriptions of a situation, and do not really account for the more dynamic aspects of social interaction – particularly the fact that, through their interactions, people can negotiate and change the definition of a social event. When looking at social interactions, rather than at the rules of dialogue encoded in software, Goffman's notion of 'framing' is useful (Jones, 2002:6).

A careful study of a communicative event such as the ANC national conference would reveal that participants continually signal shifts in their alignment, activity, and identity, as they enact their social presence to one another (Goffman, 1974). Thus the silence of the audience during President Mbeki's speech was very different to the behaviour of the delegates when unpopular members of the organisation attempted to impose order. They were able to drown the amplified signal of the microphones with their own voices, augmented in song. Rather than deferring to authority figures, they used the arm signal that football fans use to signal their displeasure with a player on their team (and to demand his removal).

The president's speech could also be investigated more closely. A humorous account from the blogger Ndumiso Ngcobo gives a sense of the dynamism of interpretive frames. Ngcobo signals his conformity to the 'rules of speaking' of the speech event by sitting quietly and listening to the torturously long speech. He watches the activities of dignitaries and the journalists around him, writes his blog entry, and he complains about the long speech in text messages to his wife, finally taking out his laptop to check the President's facts on Google:

12.01pm: The president drones on. I've logged on to my PC now and I'm keeping myself entertained by Googling stats that are contrary to the president's. I wonder if I'd make a name for myself if I stood up and protested vigorously: 'I object, Mr President! The Mafisa initiative did *not* distribute R42,2-million to 5 211 farmers. I just Googled it and that figure is inflated (Ngcobo, 2007:np).

Ngcobo is thus using 'involvement screens' (Scollon, 2001) (telephone and laptop) to signal his lack of involvement in the Presidential speech without breaking the rules of

communication for this event. Social semiotic would describe this as the 'motivated' nature of sign making – i.e. that sign makers express their social and political motivations and interests in the semiotic and communicational choices they make (Kress and Van Leeuwen, 1996).² Ngcobo is reinterpreting the framing of the event by these actions. The 'muted' modes of communication (Jones, 2002) Ngcobo chooses stop others from exercising surveillance over him or penetrating the private bubble of his text communication. They also allow him to broaden his own personal communicative context and to expand his social context.

In the ethnography of communication, the social situation is defined by the 'mutual monitoring possibilities' between participants in a social situation (Goffman 1964:134). The prevalence of mediated interpersonal communication and conversational media, means that it is necessary to broaden Goffman's definition of an *Umwelt* or surroundings to include mediated social interaction, and Jones adjusts this to define the social surroundings as 'an individual's environment of communicative possibilities' including mediated communication such as television, radio, and interpersonal communication with other people in the environment, or via a telephone, or Instant Messaging (2002:11-12). According to this logic, then, Ngcobo's social situation comes to encompass his wife in Johannesburg, Google, and the websites he reads and edits. Context is thus the evolving social reality which is constructed around and through the interaction that is being studied (Jones, 2002:6-7).

Regulating meaning

Jewitt (2006) explains the social semiotic concept of 'mode' as an organised set of resources for making meaning, or *semiotic resources*. Kress and van Leeuwen (1996) have analysed Western traditions of graphic design to show how a kind of organisation or visual 'grammar' has evolved in Western design and they analyse this as a visual 'mode' which, like language, has ideational, interpersonal and textual functions in human communication. From the social semiotic perspective then, semiotic systems such as language and visual design are all resources for making

² Jewitt (2005) turns to activity theory to provide a more developed theorisation of social issues and learning. My own approach has been to use techniques from the ethnography of communication. Both activity theory and the ethnography of communication allow a sense of meaning-making as part of situated human social activity. Activity theorists tend to label software as 'tools', and separates 'rules' from 'tools', which, for my purposes, does not allow a very intuitive way of discussing procedural and semiotic 'tools' such as software.

meaning. People make choices between possible representational alternatives, and their creative choices from the available resources relate to the specific social context and their individual motivations. Multimodal theory has analysed how choices are made both within and between semiotic systems such as language, visual design, the moving image, sound, gesture and music, and is beginning to investigate the multimodality made possible by digital texts (e.g. Cope and Kalantzis, 2000; Kress and van Leeuwen, 2001; Kress, 2003, Jewitt, 2006).

Social semiotics posits that 'grammar' is the social regulation of highly articulated modes, such as written language. Similar, but less heavily policed regularities or patterns of use are visible in other modes (such as images or gesture) (Kress and Van Leeuwen, 1996; Kress and Van Leeuwen, 2001). A semiotic mode is thus the outcome of the cultural shaping of a particular material for communicative purposes:

The more a set of resources has been used in the social life of a particular community the more fully and finely articulated it will have become. The regular pattern of using a set of resources has traditionally been called 'grammar'. In order for something to 'be a mode' there needs to be a shared cultural sense of a set of resources and how these can be organised to realise meaning (Jewitt, 2006:12).

As suggested above, the meaning of a vote at the ANC national conference was a multimodal ensemble of meanings, governed by a relatively strict grammar. The spatial arrangement of the booth, the procedure for voting, and the use of a ballot rather than a show of hands were designed to create a particular meaning – a 'secret ballot'. At the conference, it was reported that delegates had been offered bribes to vote for particular candidates and that they were expected to provide a picture of their ballot to receive their payout. Consequently, a new procedural resource was employed: special arrangements were introduced to restrict delegates from entering the voting area with cameras or cellphones, to preserve the secrecy of the vote (Wolmarans, 2007). Here, the spatial arrangements and procedural regulations tried to enable a certain proxemics which meant that delegates would cast their votes unobserved. The availability of cellphones and cameras allowed a different set of potential proxemic affordances and relations, which were consequently also regulated.

In this example, the regulation of spatial proxemics between individuals and the sequence of activities formed a set of procedures for casting a vote. These

procedures are the 'felicity conditions' (Searle: 1979:44) for the performative act of voting, but they are also the situational features used to distinguish a 'free' process of voting (and thus the truth and validity of the election results) from a fraudulent one. Although these procedures are not automated, they are comparable to the procedural actions specified in software's source code. The following chapter will establish how procedures are used as semiotic resources to govern the process of text-creation in software, and to automate the interpretation of utterances. This form of signification is crucial to software, but is not adequately theorised in social semiotics.

Conclusion

This chapter has explained some key principles of social semiotics which will be used to develop the analysis in later chapters. People make signs by bringing together form and meaning in a particular situation, where their actions and communication contribute to the evolving social reality. In everyday life, people use language and other forms of sign-making to act in the world, to orient themselves to the world and other people, and to create organised and cohesive discourse which connects with the world around them.

The story of the unused voting software has helped to suggest the importance of paying attention to the contextual meanings of technology, and of viewing software as a socially contested medium of representation. The events at the conference also suggest how socially enforced regularities or 'rules of speaking' and patterns of social power in a particular situation provide prescriptions and proscriptions for interaction, within which computer technology and other forms of mediation are given significance. These norms help people to make meanings, interpret what others are saying, and to act in socially intelligible ways. They also underlay the strategic and selective use of digital media at the ANC national conference, where the hidden operations of the voting software were rejected while equally covert SMS messages flourished. The procedures of software and other means of regulating communication in a situation are worthy of attention in themselves, but they take on particular significance in relation to the patterns of discourse around them.

Discursive conflicts mediated by software provide a particularly interesting demonstration of how software's characteristics as a representational medium have real social consequences. Software's simulation of certain forms of social interaction can be co-opted to reveal and conceal, include and exclude, and to regulate and enforce certain modes of discourse. This study investigates what happens in situations

such as the one discussed in this chapter where software and technological systems are given the power of judging a conflict between opposing interests, or of acting as a referee in a contest, especially when technology is also used to 'screen' public access to the workings of the representational system. Voting is a discursive contest judged by public opinion. In the example discussed in this chapter, the conflict was mediated by ballots, text messages, the national media and election procedures, rather than by software.

The conflict over knowledge in educational software, the 'economic' contest between websites for the top position in a search engine results page, the use of automated combat in an online dramatic improvisation, and the performance of masculine contest genres in 'Player versus Player' styles of gameplay are all analysed in subsequent chapters, as detailed in the individual chapter descriptions below. Across all the examples, numerical representations of the conflict, and of identity play a central role, influencing what is considered 'real' and meaningful in all the contexts, because of the particular power of numerical representation in software and digital media. All the contest genres discussed in this study have social ramifications. In education, children's scores influence their future prospects, in online media, search engine rankings perform an editorial and marketing function, and in the collaborative communities which are becoming new routes to knowledge, ranks, character levels, and other markers of 'elite' status offer new ways of generating social hierarchies.

The following chapters provide detailed analyses of how procedural resources are used in specific social contexts, from the seemingly minimal 'mark' on an electronic voting ballot, to the massive and persistent worlds of online gaming.

Chapter 2: Simulated systems

This chapter investigates what Zuboff referred to as the 'problem of meaning' in software, or its dual function of simulating and mediating action (1988:81). The specific affordances of software as representational medium are explored by comparing a paper voting ballot with the simulated ballot provided by a fully electronic software voting system. I suggest the concept of *mediated action* to distinguish quasi-semiosis from human perlocutionary acts. While the perlocutionary act is situated in a chain of discourse, mediated actions and artefacts in software are non-negotiable, although they are still procedural semiotic resources and thus open to strategic deployment. Software artefacts help to define what is considered 'real' about many interactions, since they constitute the lasting record of a mediated action.

Chapter 3: Studying software in use

Multimodal discourse analysis, social semiotics, user studies, the ethnography of communication, and ethnographic and semiotic approaches in human-computer interaction all provide interpretive research methods which can enrich the understanding of human-computer interaction and help researchers to engage with users' contextualised meaning-making and design practices. This chapter outlines how these methodologies can be used to analyse software as mediated discourse in particular situated contexts. These methodologies and the theoretical framework that informs them will help others who wish to study software in a social context, or who wish to develop a critical and socially informed 'procedural literacy' among users and designers (Mateas, 2005).

Chapter 4: Cheating literacy: Simulated classroom discourse in educational software

This case study presents a multimodal discourse analysis of children using 'drill and practice' literacy software at a primary school in the Western Cape, South Africa. The children's interactions with the software are analyzed. The software has serious limitations which arise from the global political economy of the educational software industry. One package was structured around the U.K. National Curriculum's standardised literacy testing, and then adapted or 'localised' for use in South Africa. In the localization process, details of content and language are customised, but the coded structure of the package (together with its educational assumptions) remains essentially unchanged. The children's interactions with the localised program are analyzed as a simulation of classroom discourse. The software demands that children choose an answer from a range of alternatives, and then evaluates their selections. The programs do not record any permanent traces of children's semiotic activities, and the software artefacts created by the programs (a numerical score) reveal their primary purpose of using quasi-semiosis to rank and score children's performance rather than to develop literacy abilities. Despite the obvious limitations of the software, the analysis shows the children constructing their own contextual meanings from the rules of the package, and learning to interact with them as a rule-governed text. Their troubleshooting and cheating exploits are a source of pleasure to them, as they focus on the software's gamelike economy of scores and marks.

Chapter 5: Setting default values: Search engines and classroom discourse.

Search engines simulate a question-answer interactional structure, which uses automated cohesion to deliver a set of results as potential 'answers' to the user's 'query'. The structure offers openness and freedom of exploration, and seems

diametrically opposed to the tightly constrained classroom patterns of drill and practice software. This chapter presents an analysis of primary school children using the Google search engine interface. Google's playful simplicity and seeming clarity of focus on the children's query does not reflect the complex interests at stake as it ranks a set of possible 'answers'. The rules used to generate the page of results reflect Google's adjudication of a conflict between websites and advertisers. In this economy, search engine ranking and user attention (represented now as 'traffic') are the contested tokens and prizes which have made online media profitable. This conflict goes unrepresented to the children and their teachers, who view the interface as a way to navigate to the 'answer' or, at most, as a kind of multiple-choice machine.

This chapter reports children's use of transcription, or what Kress terms 'reproductive writing' during search engine use. In the observations reported in this chapter, children compose queries dictated by the teacher, and write down answers verbatim, in many cases selecting one of the top ranking results. I find that the Google search has been absorbed into teacher's classroom discourse, which appropriates Google and slots it into classroom literacy practices developed around the authority of scarce printed texts. These practices, (together with the default values implicit in the Google algorithm) elevate transient, often commercially motivated texts to the status of carefully studied classroom authorities. The 'curriculum' enacted by the brokering services of the ranking algorithm are contrasted with the very different priorities of the South African National Curriculum.

Finally, it is argued that the Google interface functions as a kind of one-way glass, 'screening' its own operations from the users' awareness, while conducting intensive surveillance of their activities, which are meticulously documented as user activity logs. The chapter suggests a method of analysing and documenting the representational interests of the search engine as a whole, and of the ranking algorithm in particular.

Chapter 6: Holding the floor: Discourse and Player versus Player combat in World of Warcraft.

This chapter shifts to a very different context, that of two guilds of players from the Argent Dawn server of World of Warcraft, where I investigate the highly mediated practices of the young people who participate in these leisure communities. The chapter focuses on a multimodal discourse analysis of a short video recording of Player versus Player (PvP) combat, and considers this in terms of what such combat

means to a guild of players who prefer the PvP playstyle, I demonstrate the interactive and discursive structures of the basic combat game from which much World of Warcraft gameplay is assembled, and the specific ways in which these representational resources are granted significance within player cultures. It is beginning to be acknowledged by games researchers that games are deeply embedded in an ongoing flow of culture, which is itself discursive in nature (e.g. Steinkuehler, 2006, Squire, 2002). This analysis goes one step further in exploring the discursive character of digital games, by demonstrating that the combat game is itself a ritualised form of conversation, although it is a primarily visual rather than a verbal exchange. Both players agree to submit to the mediated action of the game in deciding the outcome and representing the contest, and so, in this exchange, the 'rules of speaking' include the rules by which players use the game's procedural resources. These new interactional rules include rules of seeing and rules of movement. The proxemic meanings of the simulated space and the chordal structures of asynchronous communication contribute to a turn-taking interaction where players aim to dominate the floor and silence their opponents, thus 'owning' them or gaining power and status from their defeat, and sometimes, their humiliation.

Chapter 7: Weaving the text: The meaning of the channel

This chapter analyses guild events of The Tribe, a player guild on Argent Dawn, a World of Warcraft roleplaying server. The members of The Tribe dramatised the wedding of two troll characters in a collaboratively designed and improvised dramatic fiction. Role-players reject the power of game mechanics, and choose to create their own cohesive structures, which are nonetheless informed by the powerful ludic simulation of the game. Players 'tune in' to certain meanings, regarding some meanings as significant, or real, and ignoring others which do not suit their purposes. Consequently, a representational modality 'mutes' the ludic game mechanics of combat, using them only where they are needed to amplify or intensify the drama of the improvised interaction. The Tribe's discourse practices are governed by carefully policed conventions which help them to achieve their dual goals of narrative coherence and dramatic interest. It is significant that such participatory communities seem to rely so heavily on exclusionary tactics in order to ensure the coherence of their discursive community and of the software effects they generate together.

A multimodal analysis shows that players frame the event, and signify their proxemic relations by code-switching between channels and semiotic modes (both within and outside the game), just as multilinguals select from their available languages according to the affordances of their environment. The chapter also illustrates that

the game environment does not record this significant player activity in any permanent way. The game enables only the transient aspects of their discourse. Their limited 'writing-rights' (Kress, 1994:21) or ability to record the events in the game means that they switch to channels outside the game for these purposes.

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Chapter 2: Simulated systems

If software is a medium for communication, how could we describe its affordances? What powers does it offer, and what freedoms might it curtail? What unique semiotic resources does it offer, and to whom? This chapter uses social semiotics to take a closer look at two ballots, one paper, and one electronic. Since they are designed with the same purpose, an analysis of the different relationships they set up, and how they are constructed can provide several insights into software as a medium.

I have used the term *software* as a generic term for digital data on computers and other devices. At the outset I should say that this is by no means an ideal term, but the word 'software' provides some useful associations for this project. The implicit separation of 'hardware' and 'software' in the term is not ideal, since the hardware of display, input, storage, processing and transfer work together with the software as a technological ensemble. Nonetheless, it had other advantages. The word describes something to be used and suggests functionality and interactivity and has strong associations with media production rather than reception. 'Software' also suggests a commercial relationship between the user and designer. Although there is plenty of non-commercial and free software, this project focuses on people using commercial, proprietary software.

The screen is not the medium – automated transduction and cohesion

Research which draws on social semiotics in the study of software, games and digital media currently focuses on 'the screen' or the logic of the graphical interface. Few theorists have attempted to look 'behind the screen' (Walton, 2004), and most analysis has focused on visual interfaces (e.g. Kress, 1997; Lemke, 2002), Kress's early claim that 'the 'screen' is the new space of representation' (1997:72) sets the tone. Explanatory frameworks from outside social semiotics (notably Manovich, 2001, De Souza, 2005 and Galloway, 2005), have all made powerful contributions, but are not framed in explicitly social and semiotic terms, and so have not made much of an impact within social semiotics.

As Galloway points out, reducing computers to 'the screen' hides the true complexity of the medium, and its combination of representational and physical resources:

Anyone wishing to cram computers into the framework of 'visual culture' is certainly suffering from an unfortunate fetishization of the

interface, as if the computer monitor were an adequate substitute for the medium as a whole, which, in addition to screens of various shapes and sizes, consists of any number of other technologies: non-optical interfaces (keyboard, mouse, controller, sensor); data in memory and data on disk; executable algorithms; networking technologies and protocols; and the list continues (Galloway, 2006:321).

Rather than being a medium that responds only or primarily to the laws of visual display, many of the characteristic features of software arise from automated transcoding (Manovich, 2001; Galloway, 2006). Source code is written by programmers, and is then automatically compiled or interpreted into the running code with which users interact. We can compare this to the process by which a play script is realised as a performance by actors, or a screenplay is produced as a film. The process of transformation where a text is transformed into another semiotic mode is called 'transduction', as defined by Kress:

a process in which something which has been configured or shaped in one or more modes is *re*configured, *re*shaped according to the affordances of a quite different mode (2003:47).³

In the case of film or theatre, human semiotic work reshapes one mode into another. In the case of software, the entire process of transduction is automated (in other words it relies on the earlier work of designers and programmers who developed the languages, libraries, browsers and operating systems that are used). We can consequently call this process of moving from source code to running software *automated transduction*.

Unlike the processes of adaptation, in, for example the adaptation of a novel into a film, the change from source code to the output mode, or modes, is automated. Consequently the textual cohesion (and interactivity) of future texts must be specified or 'programmed' in advance. In verbal texts, according to Halliday and Hasan (1979:4), cohesion occurs where 'the interpretation of some element in the discourse is dependent on that of another. The one *presupposes* the other'. In software, cohesion is automated by a programmer who writes text-making rules. Data are coded and rules written for the generation of future signifiers. This differs markedly

³ Thank you to Andrew Burn for suggesting this fruitful comparison.

from all other semiotic modes, where the collective or individual authors labour to create cohesion 'by hand' in a specific text, for a specific audience.

The main focus of this project is understanding the semiotic principles at work in proprietary software. This requires a focus on the 'higher level' cohesive relations and situational meanings of software interfaces, or software as a discourse with the user. Here it is helpful to understand software as a mode of semiotic production.

A mode of production

Jewitt (2004:184) explains that, from a social semiotic point of view, semiotic modes such as speech, writing, and images are 'technologies of representation'. These semiotic modes have been moulded through social use into 'grammars' (which evolve and vary in different contexts) or into more loosely regulated ensembles of representational resources. In contrast, communicational media such as printed paper, television or the Internet are 'technologies of dissemination' — physical means of inscription or distribution which carry semiotic messages.

This distinction is not easily maintained with software. As De Souza suggests, the distinction between technologies of representation and technologies of dissemination is particularly difficult to uphold because of the semiotic construction of digital media. She rephrases McLuhan's famous statement 'the medium is the message' and applies it to software as '[the] message is the medium', which implies that the channel of communication is itself a semiotic artefact (De Souza, 2005:254). The encoding, formatting, and transfer of digital messages all constitute semiotic decisions, and these protocols must be shared for communication to work (Galloway, 2004). The protocols thus define who can send messages, and who can receive them, or even see that they are there. The message, channel and encoding of communication converge, and, in this, software can be compared to the 'channels' of broadcast media. To give a very simple example, a document created in the latest version of MSWord will not work on machines which do not have that software installed on them, and so a user without the correct version of the application will not be able to access the 'channel' and open the document. Using this metaphor, software is a channel of many different channels, and is also a channel which allows the creation of new channels. These are governed by the 'access rules' identified by Zuboff (1988) whereby digital files can represent or address specific users and be made invisible to others.

Every software file specifies which users can access it. When an operating system creates a file in memory, it creates an entry, which shows the filename and type, points to where the file data starts and ends, gives the date and time of the file's creation, and states whether it has been archived. Most significantly for this project, it also specifies which users have permission to modify, or even to see the file. This is like a book which has a list of readers on the cover, and which specifies who may read it. Those whose names are not on the list will not even see the book or know what they are missing. Each file forms its own channel, and so do software applications and operating systems. This is a near fundamental affordance of digital media.

Software is distinctive in that, unlike other technologies of dissemination, it is also a medium of production (Jewitt, 2004:184). It is well understood that digital media allow the combination of different semiotic modes. However, certain key questions have remained unasked. For example, how does software afford designers and users (respectively) the ability to assemble and stitch together these combinations of semiotic modes? Secondly, how are these productive affordances communicated to users? Finally, what distinguishes (for example) the production possibilities of a web browser from a programming language?

Human-computer interaction specialists and interface designers have developed sophisticated design resources, methodologies and conventions to deal with these and other questions, but the field has struggled to theorise about answers without an adequate concept of signification and semiosis for an example of the confusion (see e.g. Norman, 1999).

Beyond the physical affordances of semi-conductors and electrical circuits, the affordances which allow software to produce and disseminate media are all encoded in semiotic resources such as algorithms, data structures and functions. Much of software's 'interactivity' and also what we refer to metaphorically as 'navigation' involves a simple automated process of production 'by assembly'. As De Souza's playful connection between message and medium implies (2005:254). software's algorithmic resources are semiotic in nature, although their presence may or may not be represented to users in the interface. Thus software can be considered a mode of communication which has developed specialised semiotic resources for the production, logical and mathematical processing, distribution, sequencing and storage of messages.

Interaction in discourse

This study proposes that many of software's semiotic resources and interactive patterns need to be explained in relational terms. As explained above, the relationship between participants in a conversation, and how they are oriented to one another and in relation to the world is what Halliday termed the 'interpersonal' dimension of meaning (1978:48). Here it is useful to shift from thinking about language as representing (something) to the concept of 'discourse' or a meaningful exchange between interacting participants, most obviously that between interlocutors in a conversation. These participants are also represented in the discourse, even if only implicitly (Kress and Van Leeuwen, 1996:119). For Benveniste, the concept of 'discourse' allows us to encompass all subjective uses of language which resemble spoken language in their explicit acknowledgement of their social and communicational context – for example they explicitly identify the conversational roles of 'I' and 'you'.

Discourse must be understood in its widest sense: every utterance assuming a speaker and a hearer, and in the speaker, the intention of influencing the other in some way (Benveniste, 1971: 208-9).

Because the word 'discourse' is derived from the meaning of a 'conversation' which unfolds in time, 'discourse' has other useful associations. For example, Hodge and Kress (1988:6) define discourse as more than just written or spoken words, but, following Foucault, they see it as 'the social process in which texts are embedded'. This definition focuses on the existence of communication in time, of the ephemeral flux of discourse, and the more permanent traces discourse leaves in the form of 'texts':

Text is only a trace of discourses, frozen and preserved, more or less reliable or misleading. Yet discourse disappears too rapidly, surrounding a flow of texts (Hodge and Kress, 1988:8).

This definition helps us to see that images can also be part of a discourse, where the interactive participants are viewer and image producer; user and software designer). In discourse, pronouns such as 'you' and 'I' represent the interactive participants, and grammatical forms such as the imperative (commands) are used to represent and enact a certain kind of relationship between the interactive participants.

Speech act theories derived from the work of Austin and Searle have made some impact in human-computer interaction, particularly after the work of Winograd and Flores (1986). The linguistic and semiotic approach to understanding language as social action is less widely known. Here the work of Halliday is particularly important, in his exploration of the 'social meaning of speech acts' (1978:72), Halliday addressed the question of the situational meaning of discourse suggested by Austin's concepts of illocutionary and perlocutionary acts.. Looking at illocutionary and perlocutionary acts in the context of an interpersonal dialogue, Halliday pointed out that such speech acts were dialogic, and fitted into interactions, or exchanges. The addressee can usually choose to confirm, hedge, or negate the intention of the speaker's act in a response using pairs such as question-answer, demand –give, or instruct-obey – what Halliday called 'an interact' (Halliday, 1985:68). Halliday defines four basic interactive structures, namely, offering information, demanding information, offering goods and services, and demanding goods and services. In many cases, the interaction is not only linguistic, but draws on a range of signifying resources – someone 'replies' to a verbal request for an item by the gesture of offering the item requested.

Pictures are also used to represent certain kinds of relations between the viewer and the producer. Where a person in a picture looks directly at the viewer, the viewer is addressed visually as 'you'. The 'I' or the producer of the picture is absent (Kress and Van Leeuwen, 1996:127). Instead, the viewpoint or perspective of the image producer is conveyed by the 'eye' or how the camera frames the shot in a photograph, with which the viewer identifies. The position of the camera thus influences the viewer's orientation towards, and sense of social proximity to the subject of the photograph. Kress and Van Leeuwen show how pictures of people can either be an 'offer' (where a photograph is shot from an oblique angle) or a 'demand' (where the person looks directly at the viewer). Similarly, Kress and Van Leeuwen notice that visual language cannot directly enact an 'offer of goods and services' (Halliday's term for one of the basic linguistic interactions that he identified) (Kress and Van Leeuwen, 1996:129).

In contrast, software interfaces have developed a wide range of conventions to represent their 'offers' of functionality. In fact, one of the primary functions of an interface is to convey interactive meanings and procedural affordances. Social semiotics can help to identify and analyse these meanings, and show how potential for interaction is communicated to users, while addressing them in a particular way and positioning them in a specific kind of relationship. To illustrate this, I provide a brief

comparison of the interactive semiotic resources of a paper voting ballot and an electronic voting system. Key issues for consideration are how the encoded 'rules of speaking' (Hymes, 1974) of a genre of interaction simulate a particular activity in software. The simulation does not only suggest a particular form of interaction, but also includes a representation of the participants and their relations.

Some new vocabulary is needed to speak accurately of these new dimensions of signification. In particular, I propose that in software the perlocutionary act (or the situational meaning of the computer-mediated action) is supplemented by a quasi-semiotic *mediated action*, which creates both software's transient effects, and also the more permanent artefacts of interaction. Particular insights can be gained by investigating which aspects of the interaction are stored in persistent form as an artefact of interaction (in the digital or analog medium). These artefacts often provide clues to the real value of the interaction to the participants, and particularly to the designer.

Simulated order in procedural genres

To understand clay is not to understand the pot. What a pot is all about can be appreciated better by understanding the creators and users of the pot and their need both to inform the material with meaning and to extract meaning from the form (Kay, [1984] 1999:130-31).

The physical affordances of binary code can only take us so far in understanding the semiotic resources of software. As Kay points out above, the motivations and interests of a generation of creators and users have already shaped the basic informational medium into a diverse collection of semiotic resources and procedural genres hosted by an ever-adapting array of hardware. Many of the new digital media imitate, or produce simulations of the older analog modes. This is known as 'cultural transcoding' or 'remediation' (Bolter and Gruisin, 2000; Manovich, 2001). In these procedural genres, the format is essentially a set of rules by which the binary code is able to simulate the sensory qualities and modes of interaction associated with an older form of media. (Such as, for example, digital video simulating analog video).

Simulation is a central area of interest in the discipline of games studies. Salen and Zimmerman (2004) define a simulation as 'a procedural representation of aspects of 'reality'', and assert that all games are simulations. According to this definition, software is also a simulation, because it is also a procedural representation of the user's activity. The user explores the software in an ongoing process of generating

mediated actions. This is the performative dimension of software. Within the interpretive 'frame' of a simulation, certain relationships and rules of interaction apply. The circumscribed nature of the rules means that framing in software applies an explicitly specified set of 'rules of communication'. In Turing's terms, software translates the 'book of rules' used by human 'computers' into a 'table of instructions' that can control a machine ([1950]2003:52). Unlike the more malleable and responsive processes which apply when participants negotiate framing and co-construct a situation through human social interaction, software provides fixed rules and structures, and the limited interpretive capacities of quasi-semiosis.

Thus interfaces offer a freedom of action which is always, to some extent, illusory. Source code constitutes a new procedural genre, or a collection of rules that regulate the actions of others. Kress explains the interpersonal relations set up by procedural genres in other forms of discourse, such as recipes, or administrative regulations and procedures:

Procedural genres, like all genres, project a world with a larger order, a coherence: whether, as in the recipe for duck à l'orange, a necessary sequence of steps to achieve the perfect dish, or in the procedure through which a scientific experiment, an industrial process, or a social event is set out (Kress, 2003:102).

In other words, procedural genres are based on models of an ideal version of reality, governed by a simple and specifiable set of rules. We often speak of the 'lower' levels or layers of code and acknowledge the power of those who program them. The source code is seen as a kind of 'deep structure' of the interactive text. As Ullman points out, there is an implicit valuation in these accounts, particularly prevalent among programmers: 'In regular life, "low" usually signifies something bad. In programming, "low" is good. Low is better' (1995:135).

Transformation takes place in time, and the transformed source is not 'lower' but simply 'earlier'. This process can be compared to that which takes place with transformations in language, as explained by Hodge and Kress (1988).

When procedural genres are translated into software, the application constructs a procedural representation of some activity. Graphical user interfaces (GUI) are second-order simulations in the sense that they employ a visual 'representation or

model of reality' to simulate the procedural representation of the system (Schneiderman, [1983] 2003:496).

For this reason, users often experience a conflict when the rule-governed coherent world of software does not cohere with their needs, and when the interface promises freedom, but this clashes with the reality of underlying coded constraints. Procedural genres have evolved to set up different relations of affordance and constraint for their users. (Compare, for example, the different patterns of interaction and text production associated with an editable Wikipedia page, a multinational corporation's official home page or a 3D computer game.)

While all frames enable meaning, the software frame generates mediated actions in response to input from the designer and user. According to Frasca, a simulation 'cannot be understood just through its output' and the constitutive rules which generate the experience should provide a central focus of attention in an analysis (Frasca, 2003:224). What procedures, sequences and relationships of compulsion and freedom hold a simulation together? This study focuses on dialogic sources of coherence and the interactive relationships that these express.

Through interpreting the illocutionary act and thus confirming the perlocution, a discursive act helps to define social reality. This is an ongoing process, however. For example, a party representative has the opportunity to question a counting officer's interpretation of a ballot, thus continuing the negotiation of what the voter 'really' intended, or what the rules 'really' mean. In contrast, the mediated action of recording the vote in the software system is not negotiable, and the artefact created comes to define the 'reality' of what happened in the election. As Van Dijk (1997:9) points out: 'discursive activity becomes socially 'real' if it has real social consequences'.

Procedural genres thus provide mediated action by setting the conditions for users' intended actions, or illocutions. The relationships that are constructed through the procedural genre shape the user's experience and simulate wider social patterns of interaction.

Voting as discursive interaction

Voting is a discursive interaction between state and citizens, and is used to mediate a social contest. The election itself can be seen as a simulation of a social contest. Here it is helpful to step away from common sense beliefs about elections and democracy,

and to think of how the electoral contest resembles other simulations of conflict, such as those found in computer games. According to Salen and Zimmerman's taxonomy of conflict in games and simulations, the spoils which are most often contested in represented contests are territory, economic tokens, or knowledge (Salen and Zimmerman, 2004:433-4). To apply Salen and Zimmerman's terms, an election is first an economic contest, where candidates compete over tokens, or a form of 'currency', which in this case are the votes of individual voters. Second, it is a territorial contest, or the battle to govern the constituencies and regions in question. Third, the voters can play the role of witnesses to the electoral conflict, supporters egging on the contestants, and the judges deciding the outcome.

As Frasca points out, games and ludic simulations have 'goal rules', which determine the objectives of the contest, and 'manipulation rules' which influence the kinds of actions and relationships that are possible within the rules of the procedural representation (Frasca, 2003). The election as simulation sets up 'goal rules', which, depending on the nature of the democratic system, requires candidates to compete to win the largest number of votes or of constituencies, depending on which meaning of the contest is central. The rules of the game, or 'manipulation rules' in Frasca's terms, also define other issues, for example, who is allowed to vote, how constituencies are defined, and whether the system is a party-based system. Only systems which allow participants to contest these procedural assumptions supply 'meta-rules' or the rules which allow a certain amount of freedom to change the rules (Frasca, 2003:232).

Methodology – semiotic analysis

The previous chapter briefly introduced the importance of context in the process of sign-making. This chapter outlines an analytical approach to reading software texts as procedural designs. I will use a social semiotic analysis of the national ballot from South Africa's first democratic elections in 1994 and three screenshots of a system of electronic voting used in a mock election in Maryland in the U.S.A. (from a usability trial conducted after the software was already in use). The ballots represent the voting procedures in two countries with very different electoral systems.

This approach allows for a careful focus on individual designs, and tries to get to grips with some possible motivations of the designers, particularly as these are represented in the ballot itself and in practices of production and distribution. The analysis should not be taken to imply in any way that the readings I present are the only readings, or that my interpretations are representative of the readings that might have been

made by other people at the time when the ballots were used. The ballots are considered out of context, which is to some extent inevitable with historical texts.

The conflict about the use of voting software discussed in the previous chapter raises interesting questions about what happens when an electoral conflict is mediated by print, on the one hand, or by software, on the other. My purpose in presenting this comparison is to illustrate an approach to textual analysis which looks carefully at the software text and reads the design as a social artefact. The aim of the analysis is to introduce the reader to the social semiotic approach to analysis, to introduce some key terms, and to develop some concepts within this broad framework which allow me to consider the ways in which software represents interactivity, and how it mediates and constructs interactions. Semiotic analysis can be a very useful diagnostic and teaching tool, although, as the following chapter will explain, it has significant limitations when it does not attend sufficiently to the discursive context within which meanings are generated.

Lemke has made important contributions to the understanding of interactional and textual meanings in what he calls 'hypermedia'. Lemke uses the word 'orientational' to refer to how a text signifies what is happening in the communicative relationship, and what stance the participants may have to each other and to the presentational content (Lemke, 2002:304). Lemke reads online media as a composite semiotic where the interactive and orientational repertoire of language, images, and sound function together to position and orient the user of online texts. Lemke points out that most people are only consciously aware of the representational or propositional content of a message, except under unusual circumstances. Hence the power relations implicit in texts go unnoticed, while the organisational, or textual meanings of how a text is put together are often only noticed by professional users of a medium. As a result, textual power goes unnoticed, and inequitable conventions are often unquestioned:

Such approaches, of course, are highly uncritical. They ignore power relationships, presupposing institutional roles. They ignore the limitations of genre conventions on possible new meanings (Lemke, 2002:306).

Semiotic analysis is a method of raising awareness of the social implications of a text's design. As an approach to studying the construction of software in terms of its potential social impact, it can also be a valuable tool in the training of socially and ethically responsive designers, programmers, and usability practitioners.

Several other authors who share the general theoretical concerns of Kress and Van Leeuwen (1996), have approached the multimodal analysis of interactive texts. For example, Lemke (2002) has analysed websites and Burn has analysed computer games (Burn, 2006), digital video, animation and websites (Burn and Parker, 2003) and game authoring tools (Burn and Durran, 2007).⁴

I will not attempt a discussion of all the multimodal meanings of the two ballots, but focus on conveying the interactional and textual components of the meaning of interactive texts, which are not well understood. I look for the ways in which a design enacts social power, or traces of social history of its production context in the appearance of the text. I suggest three new methods to represent these dimensions of software, and demonstrate them through a detailed analysis of the interactive or dialogic features of the design.

Dialogue on paper

The ballot from the 1994 national elections in South Africa (Figure 1) speaks of a particular historical moment in the negotiated transition from apartheid South Africa, to the post-apartheid democratic order. The urgency of ensuring widespread access to the voting process and lending legitimacy to the poll informed particular design features of the ballot. My analysis of the ballot will draw attention to the specific contributions of social semiotics as a theory to the process of reading a visual and interactive design. The analysis is presented in terms of the semiotic metafunctions discussed in the previous chapter.

The ideational meanings of the ballot (or what it is about) are conveyed by the heading 'RSA 1994', above a set of contestants (the political parties). Within the header, in the central, most salient position of the design is an abstract, outlined map of the country. South Africa is presented as a blank space which, perhaps, the action of voting will help to define. The written text is a command 'Make your mark next to the party you choose'. In Hallidayan terms, this is a 'demand for information' (a demand for the voter's 'mark') which also instructs the voter on how to complete the ballot. In another reading, it is an invitation which represents the implicit promise of South Africa's negotiated settlement – through participating in democracy, ordinary South Africans will be able to 'make their mark' and bring about social change.

⁴ The approach to analysing video recordings of people using software and games is a somewhat different approach, and is discussed in Chapter 3 (Jewitt, 2004).



Figure 1: A paper voting ballot from the South African national elections in 1994

The verbal text of the paper ballot depicted in Figure 1 addresses the (literate) voter in South Africa's eleven official national languages. The languages are arranged in two visual paradigms. (A paradigm establishes a set of equivalent or comparable terms, and thus establishes a category.) The meaning of the paradigmatic arrangement suggests inclusivity at the same time as it excludes non-citizens from this particular discourse. It says simultaneously 'make your mark, South Africans', and 'Pick a language, any language, as long as it is one of these eleven'.

All of the party names address the voter in English, with eight providing a translation or a word from a local language. The party names, while written in English, may well be part of common parlance and be included in many people's linguistic repertoire, even if they do not speak English. However, the relatively unknown parties with English names, and the parties which provide a translation to one language only are deliberately addressing themselves to a particular 'linguistic group'. Also notable is the 'code-switching' or shifts between languages within the party names, such as for example, the isiZulu word *inkatha* (a word used to signify Zulu national unity) is used in the Inkatha Freedom Party. The right-wing Vryheidsfront is the only party to select a different default language, by positioning Afrikaans before the English version of the name. Both the National and Democratic parties only provide translations into the official languages of apartheid South Africa. These examples of translated names, ironically, signify a more exclusive address than some of the parties which present only the English versions of their names. By offering the 'courtesy' of translating their party name into one other language, there is an implicit slight on those spoken by other South Africans. Language is used to signify ethnicity and all its complex local meanings on this ballot.

The ballot also addresses the voter in a range of modalities, thus catering for voters who do not read. Each party is represented multimodally, with a combination of a name, logo, acronym and photograph of the leader (or, in one case, the leaders), thus suggesting additional ideational meanings through the icons in the logo, and the physical representation, including gender and ethnicity, of the party leaders. The list of the parties, considered as a whole, is a visual 'offer of goods and services' (the future services of the candidate parties). The visual address of the party leaders is, in all but one cases, a direct gaze that demands acknowledgement. With only three

exceptions, the smile and framing of the shot (close up) offers a friendly and close relationship.⁵

The position of parties on the list are allocated randomly by a lottery, since the most salient or noticeable position is at the top of the list. This can give that party a small advantage in certain kinds of elections. The overall layout of the page frames the parties, and the white boxes draw attention to the space waiting for the voter's mark. The visual syntagm or set of alternatives implied by this framing may suggest that the list of candidates is 'given' and the voter's response, or selection is 'new'. Kress and Van Leeuwen (1996:187) suggest that this pattern of interpretation arises from Western reading patterns, where the eye is trained to move from left to right. The item on the left is often taken to represent something 'given' or something the viewer already knows, whereas the item on the right is classified as something 'new', or unknown. In this case, the arrangement seems to suggest the temporal sequence of dialogue – the offer- response pattern, with an empty space for the voter's communicative act which will complete the dialogue. The interactive *offer* of the ballot is thus the invitation to make the mark in a specific place, but it is possible that voters without much experience of reading might not see it in this way.

The voter's mark is a response to this combination of offers and demands. The mark is an inscription which changes the meaning of the ballot as a text (in that way it is similar to graffiti). Unlike graffiti, the voter's mark on the ballot is simultaneously a response to a demand (the verbal instruction and visual address of the leader's photograph), and the acceptance of an offer (the choice suggested by the list of parties). The grammar of the ballot is thus a form of visual syntagm. The ballot itself is the equivalent of a performative verb, and the voter's selection from a paradigm (the list of candidates) completes the sequence (or syntagm) implicit in the visual structure.

The ballot is only given the perlocutionary force of 'a vote' once the counting officials have interpreted it. As indicated in Figure 2, an extract from the counting officer's procedures, interpretation guidelines specify that a legal mark can be placed anywhere on the frame around the party name, as long as it indicates a clear choice (Independent Electoral Commission, 2005). In semiotic terms, the voter can inscribe any mark that heightens the visual salience of one of the parties. (It is significant that

⁵ I will not discuss the meanings of the party names or logos. Although they are important, this would involve a lengthy digression which is not the focus of this study.

this central rule is not indicated anywhere on the ballot.) The *visual arrangement* of the parties and empty spaces for the delegate to mark 'X' are the textual aspect of the meaning – the ballot employs framing and tabular alignment as a form of visual cohesion or syntax.

The semiotic conventions and rules of interpretation and procedure are so familiar as to be almost invisible to most people accustomed to democracy, but these conventions and the other procedures and principles of democratic elections required careful explanation during the democracy education campaigns in South Africa before the elections of 1994, particularly to voters with little formal literacy (Teer-Tomaselli, 1996).

As example 9 in Figure 2 indicates, it would be quite possible for a voter to 'misread' the offer of the ballot as the offer of a different kind of interaction, and, for instance, to rank the candidates (as in ranked ballot systems of voting). The vote-counter would have to 'read' this as a spoilt ballot. Although the voter's intentions as a sign-maker, (or her illocutionary act) might clearly indicate other rules of interpretation, the strict grammar by which ballots are interpreted would force the counting officer to impose a different, and more mechanical perlocutionary act. While the design of the ballot can suggest a particular interaction and relationship to the voter, it is up to the voter, and later, the vote-counters, to decide what rules of communication apply to this particular interaction. Ultimately, the counting officer has the social power to decide any disputes about the meaning of an ambiguously marked ballot.

In addition to the meaning of the paper ballot and the voter's mark, there are a number of very important *procedural* resources that are used to try to ensure that the ballot represents the single secret vote of an authentic voter. As explained above, voting is an economic contest, with the voters, or their ballots, as tokens in the battle between the contending parties. These procedures try to ensure that all votes are 'legal tender'. Before voting, and in order to be eligible to receive the ballot, and thus the *offer* of the list of candidates, the voter must produce identification which matches a name on the list of registered voters. Her name will be marked on the list, and her finger will be inked so that she can only vote once. Because this is a secret ballot, possession of the physical ballot itself identifies the author of the mark as an authentic voter. The diagram in Figure 2, provided by the South African Independent Electoral Commission, suggests how the procedures and spatial layout of the election venue are set up to control the meaning of the ballot.



Examples: Rejected Ballots

Better Future Party	🎵	BFP	👤
The Sunrise Party	🌅	TSP	👤
The New Day Party	🌄	NDP	👤
Clear Vision Party	👁️	CVP	👤
Consensus Party	👏	CP	👤

1. Intent of voter is unclear

Better Future Party	🎵	BFP	👤
The Sunrise Party	🌅	TSP	👤
The New Day Party	🌄	NDP	✓
Clear Vision Party	👁️	CVP	✓
Consensus Party	👏	CP	👤

2. Intent of voter is unclear

Better Future Party	🎵	BFP	👤
The Sunrise Party	🌅	TSP	NO
The New Day Party	🌄	NDP	👤
Clear Vision Party	👁️	CVP	👤
Consensus Party	👏	CP	👤

3. Intent of voter is unclear

Better Future Party	🎵	BFP	👤
The Sunrise Party	🌅	TSP	👤
The New Day Party	🌄	NDP	X
Clear Vision Party	👁️	CVP	👤
Consensus Party	👏	CP	○

4. More than one vote cast

Better Future Party	🎵	BFP	👤
The Sunrise Party	🌅	TSP	👤
The New Day Party	🌄	NDP	👤
Clear Vision Party	👁️	CVP	👤
Consensus Party	👏	CP	👤

5. Choice of voter is unclear

Better Future Party	🎵	BFP	X
The Sunrise Party	🌅	TSP	X
The New Day Party	🌄	NDP	X
Clear Vision Party	👁️	CVP	X
Consensus Party	👏	CP	X

6. More than one vote cast (i.e. voter has made marks for more than one party)

Better Future Party	🎵	BFP	👤
The Sunrise Party	🌅	TSP	👤
The New Day Party	🌄	NDP	👤
Clear Vision Party	👁️	CVP	👤
Consensus Party	👏	CP	👤

7. Choice of voter is unclear. Choice of voter for a person, not a party. Also literate voter who has not made a mark showing his or her choice.

Better Future Party	🎵	BFP	👤
The Sunrise Party	🌅	TSP	👤
The New Day Party	🌄	NDP	👤
Clear Vision Party	👁️	CVP	👤
Consensus Party	👏	CP	👤

8. Ballot is unmarked.

Better Future Party	🎵	BFP	5
The Sunrise Party	🌅	TSP	2
The New Day Party	🌄	NDP	3
Clear Vision Party	👁️	CVP	4
Consensus Party	👏	CP	1

9. Intent of voter is unclear. Also more than one party marked on ballot.

Figure 2: Instructions to counting officers on the interpretation of ballots (Independent Electoral Commission, 2005)

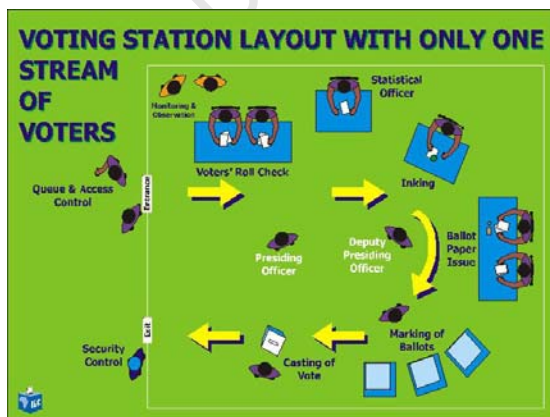


Figure 3: An Independent Electoral Commission diagram illustrating the spatial and proxemic procedures which regulate the process of voting in South African elections (Independent Electoral Commission, 2005)

The simulated ballot

By way of comparison with the South African paper ballot 'interface' and procedures, the electronic voting interface of the Diebold AccuVote-TS, a Direct Recording Electronic (DRE) voting system used in the state of Maryland is reproduced in Figure 4. The interface is a ballot from a mock election conducted for a research project reported by Bederson *et al.* (2003). The system simulates the interface of a paper ballot, with a few significant differences.⁶

When voting begins, a card reader checks a card issued by voting officials and then authenticates the voter as a registered voter. Second, a startup screen allows the user to elect to vote in English or Spanish, with English being the default language. After that, all text is personalised in the language of choice.

The electoral data on the electronic ballot is for a mock election in a usability test, rather than a real one. The voting software allows the voter to vote in three different ballots, with some of the elections allowing a choice of more than one candidate.⁷

The ballot itself is a three-screen, button-navigated sequence. Considered as a whole, it is a somewhat uninspiring example of interactive design. For some reason, a single alignment rule seems to have been applied to centre all the text, thus reducing the readability. Textual instructions are provided separately in an initial screen which provides 'Instructions to voters' in the form of somewhat strident demands for interaction 'TOUCH the box to the left of your choice'. The command is 'shouted' by the use of all capitals and underlining in some of the other instructions. On the ballot page, the demands and rules of the interaction are all implicit in the visual design.

⁶ The usability of this particular design was evaluated in a comprehensive study by Bederson *et al.* (2003). This analysis uses the findings of the evaluation to understand interactive relationships and the address of the software interface.

⁷ The South African election included two separate elections (national and provincial government, but each election was presented on two separate ballots – the provincial ballot was not analysed for this study.

Interactive components of the design, such as the button controls, are all given a slight graphic bevel, suggesting the higher modality or reality of a three-dimensional object, their salience heightened by the use of contrasting colours. The 'check box' is given a three-dimensional treatment, as a simulated depression, possibly to encourage the user to provide 'input'. Navigation and transactional commands use a bevelled button design, which 'pops out' of the two-dimensional display. Both are conventional methods in software of increasing the salience and so drawing the user's attention to the interactive features of the design. The check box control allows the user to 'inscribe' the ballot with a cross, thus simulating the affordances of ballot paper.

The design distinguishes visually between the navigational selections and the selection of the candidates from a list, and there is a small difference in the size of the button for navigating to a new page, and the button which triggers the non-reversible mediated action of casting a vote. Although the visual inscription has already been made, the vote is only recorded once the user presses the 'Cast Ballot' button, and it cannot be adjusted after the ballot is 'cast'.

Although the user is given the opportunity to review and change or confirm the vote, this vote only has the status of an offer, or illocutionary act. The final mediated action of the system (storing the vote in the results database and incrementing the total) is not visible to the voter. This inaccessibility of the internal representation is another example of 'the problem of meaning' in software systems, and is the major reason that DRE systems have many critics, who point out that such systems are vulnerable to major fraud. Since the touch screen devices run the Windows CE operating system, the task of ensuring the integrity of the electoral process is entrusted to employees at Microsoft and Diebold.

Representing interaction for analysis

The difference between 'offer' and 'demand' in the visual language of the voting application is not as clear-cut as it would be in verbal language. Variation in the extent to which the system compels the user to do something shapes any interactive experience. The following analysis is an attempt to respond to the challenge of representing and analysing these experiential dimensions of certain genres of software.

Interaction structures in most software packages are characterised by highly complex non-linear structures and potential combinatorial explosions of branching. For this

reason, the interactive structures of a package are not always easily represented or visualised. Hyperspace is infinite, but human representation is bound by limitations on cognitive and representational space. Short term memory accommodates only a few items of new information at a time, and sheets of paper and computer screens really only provide a couple of square inches in two dimensions on which to represent hypertextual structures. Tools such as flow charts and state diagrams provide a representation of a structure as a whole (or a third person perspective). Similarly, the practice of describing use case scenarios is a linguistic design tool which represents the projected experiences of a user or 'actor' and their experiences when using the system. Once again, this is written in the third person. To understand the interpersonal meanings and social relations of compulsion and choice in interactive systems, I propose a shift from a third person perspective to a second person perspective in representing interaction.

Second person - speaking rules, writing-rights, and rules of seeing

Here a combined sense of Halliday's interpersonal metafunction in verbal language (Halliday, 1978:48) and Kress and Van Leeuwen's sense of the 'interaction' between a viewer and producer of a visual text (1996:119) can help us to get to grips with the procedural meanings of a software package. The objective is to represent what the system offers to and demands of the user, or its 'speaking rules' ([1986]2003:37), and the 'writing-rights' (Kress, 1994:21) it allocates to users. The visual appearance of software is rule-governed, which means that it can be 'customised' or 'localised' for particular categories of users, and so a second person perspective helps to explore how the software configures itself for certain types of users. By analogy, I have called this software's 'rules of seeing'. Modality and the linguistic resources of person can provide a way of clarifying the interactive relationship as a package of offers and demands. The aim of this procedural representation is to suggest how users might experience being 'addressed' by the package as a procedural genre.

Table 1 demonstrates a method of representing the orientational, or interactive meanings of a system by using linguistic modality markers to represent its offers and demands of functionality in relation to some specific goal. The system demands an interaction when it makes a specific action compulsory (either because it offers no other alternatives, or because that interaction is required for the user to reach her goal). The system offers a feature or action if it is an optional action en route to reaching the goal. Thus, to use a grammatical metaphor, the design suggests that the user 'may', 'must', 'might', or 'should' make a particular choice. This balance between offers and demands an indicator of the difference between a complex,

open-ended interface such as that of a word processor, and the far more limited options and more constrained sequence of the simulated ballot.

<i>Paper ballot, South Africa,</i>	<i>Electronic voting (DRE, Maryland)</i>
<p>In order to vote in this election, you Must have an ID card and be on the list of registered voters Must not have voted already Must cast a ballot marked in some way to indicate the party of his/her choice Must be sighted. Should be able to read one of eleven languages or recognise political parties from their acronym, logo, leader or party name</p> <p>Along the way, you May select a preferred candidate from a list in two separate elections. May select a preferred party from a list by marking the ballot in the expected place May be issued another ballot if you make a mistake</p> <p>Might mark the ballot in some unexpected, but nonetheless legitimate way Might spoil the ballot by overvoting Might leave the venue without casting a vote</p> <p>Perlocutionary act: After the citizen casts the ballot, it should be sorted, interpreted according to the correct procedures, and tallied by the counters, unless the ballot box is lost or stolen or the counters and monitors are all corrupt</p>	<p>In order to vote in this election, you Must be able to use the touch screen device and be granted access to the election software with a card issued to registered voters Must navigate through all three screens of the voting application Must confirm the choices of candidates before they are recorded as votes. Should be able to read in English, unless you can understand spoken English or read Spanish Should be able to undervote</p> <p>Along the way, you May select a preferred candidate from a list in three separate elections May go back to review, and change the choices May read the instructions May notice that you have not voted on all the available ballots</p> <p>Might select one of six candidates on Ballot One Might select two of six candidates on Ballot Two Might select three of six candidates on Ballot Three Might figure out the way to erase an incorrect choice Might overvote Might give up or leave without casting a vote</p> <p>Mediated artefact: After the citizen confirms the choices, they should be correctly recorded by the system as votes, unless it is hacked or set up incorrectly</p>

Table 1: Two voting interfaces represented as procedural genres

This method foregrounds the representation of interactive relations between designer and user. It can help to identify what action is being simulated and allow the designer to recognise the power relations implicit in the form of representation which is chosen to mediate a simulated goal-driven activity.

In Table 1, the differences and similarities between paper and software ballots are detailed in terms of the interpersonal relationship they establish between the voter and the system. (These differences relate to the overall design of the communicational event, rather than to the medium in itself.) Like simulations, this kind of interaction has a 'goal rule' – in this case, 'voting in the election'. Compulsory actions which have to take place for the voter to achieve this goal are represented


with the word 'must'. Optional actions similar to the 'manipulation' rules of a simulation (Frasca, 2003) which are offered to the voter and which the system thus explicitly permits are represented with the word 'may'. In cases where there is a smaller likelihood that an optional action will be chosen, but where it is not explicitly shown in the interface it is represented with the word 'might'. An option with a default value is represented as 'should'.

Both ballots prioritise the need to bar access to non-registered voters. This is a central focus of the interactional meaning of both systems, and so it is not unreasonable to conclude that both represent voters primarily as 'tokens' in the election game.

The paper ballot does not assume a default language, although many of the parties do. The ballot allows for multimodal visual communication with illiterate voters, but excludes non-sighted voters from the opportunity to vote in secret. Overall, the ballot presents many simultaneous offers and demands and gives the voter a great deal of freedom in composing the illocutionary act. Crucially, it does not clarify the rules for its interpretation, which is a human perlocutionary act, governed by strict procedures. It nonetheless allows some leeway for interpretation and contestation. The process is considerably slower than electronic counting, and is also open to interference but can be more easily audited by ordinary citizens and electoral monitors.

The electronic voting system assumes a default language and assumes that anyone who cannot read text on a screen would be blind. It breaks up the action of voting into a sequence of offers and demands for selecting and confirming candidates, but the process of voting itself has many complex rules which are not represented or explained in the interface. Most seriously, as Bederson *et al.* (2003) point out, the design does not alert voters to undervoting. The mediated action of recording the vote is instant and efficient, but the resultant artefact is entirely invisible, 'screened' from view within the system. Although various digital solutions have been suggested, these are not completely under user or system control, and cannot be audited.

Figure 5 and Figure 6 illustrate the difference between the procedural sequence of voting with the ballot and voting electronically. This representation uses a visual syntagm, or set of elements combined in a meaningful sequence, to represent an individual action path. An action path depicts how a communicative event is sequenced from a series of actions to achieve a systemic goal or mediated action. The paradigmatic dimension of the diagram represents to what or to what extent the

event allows choices within this overall discursive structure. An  icon indicates that access to the channel is barred at this point, and, as the key explains,

The diagram also distinguishes between illocutionary acts, and mediated actions, and in the paradigmatic structure, represented options and non-represented options.

The voting software automates a number of the steps which are handled by physical movement around the venue in the paper ballot system. It adds some self-identification steps (language, audio interface) to the external authentication sequence, and sequences the voting process far more strongly than the paper ballot. It divides the action of marking the ballot into two steps, which are both reversible. By contrast, the paper ballot presents all the information simultaneously. The visual layout of the ballot thus offers a 'less strictly coded' reading (and action) path than the software (Kress and Van Leeuwen, 1996). Once the voter is presented with a ballot, there are a number of activities that can happen in any order before the voter actually casts the vote.

Hypertext is often equated with freedom from the constraints of linear textual structures (e.g. Lemke, 2002), but linear sequencing is a key resource in many software operations, particularly those sequences which employ access events or 'authentication' routines. These are an essential component of the 'access rules' for the software channel, which can be encoded at the file level, as discussed above.

Overall, the software system offers a great deal less freedom to the voter than the paper ballot does, and provides a considerably more complex interface than the voting ballot. The lack of communication about the check-boxes and how to cancel an incorrect vote raises the real possibility that the voter may vote for someone erroneously.

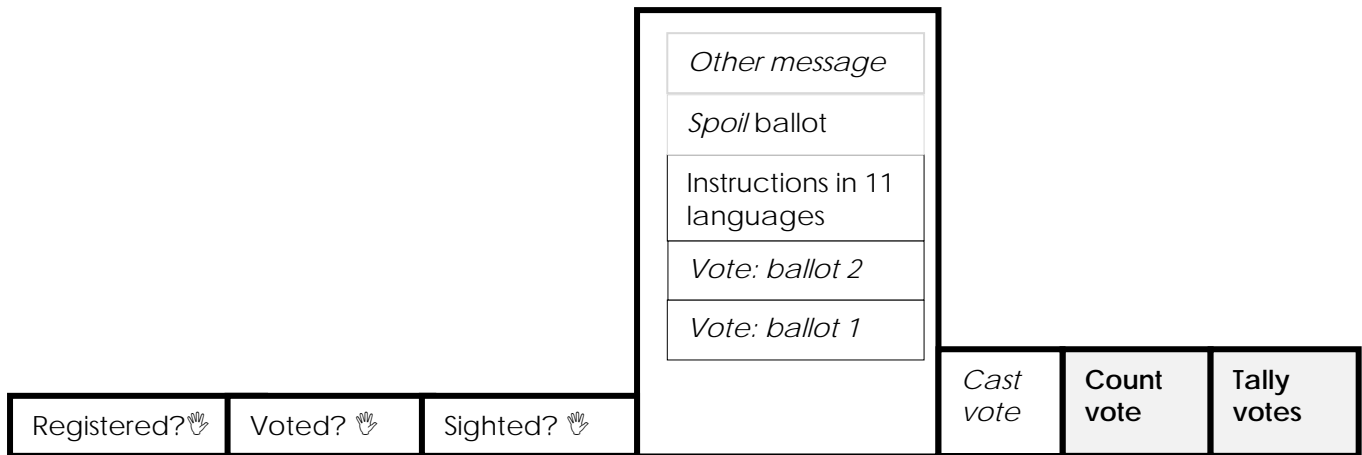


Figure 5: Casting a secret ballot with a paper ballot - syntagm and paradigm

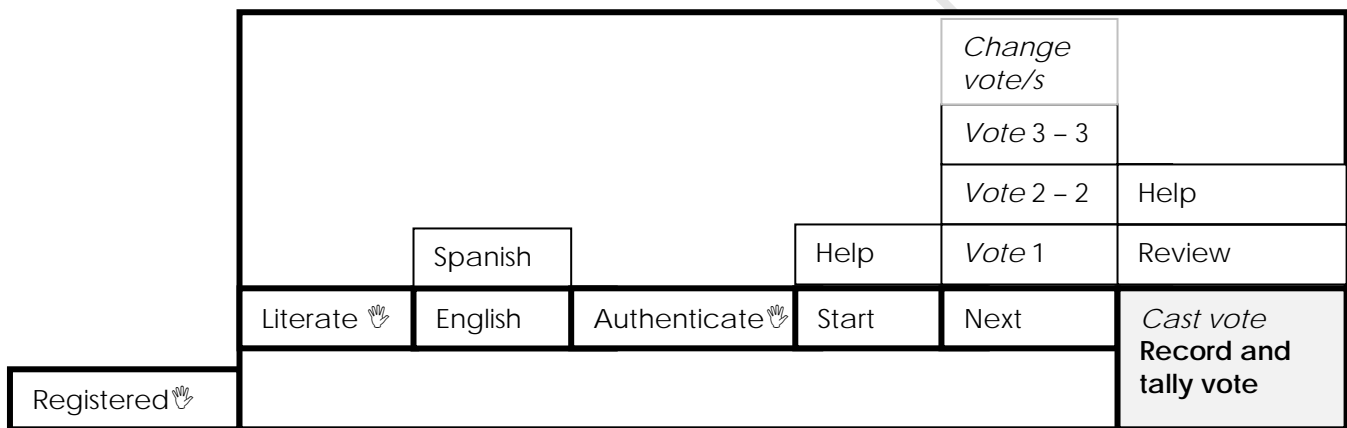


Figure 6: Voting electronically with the visual interface to the Diebold DRE - syntagm and paradigm

Key to diagrams in Figure 5 and 6

Cast vote

Italics represent user's intended illocutionary act.

Spoil ballot

Faint outline indicates an unrepresented action.

Tally votes

Bold type represents system's mediated artefact

Vote 1

Solid outline indicates that this action is represented on the ballot

Registered?

Hand icon represents access event

Although the information overload is reduced by splitting the ballot into a sequence of screens, the demands on memory are significant. Unsurprisingly, the evaluation found that many users experienced difficulties voting, and predicted that significant amounts of voter education would need to take place. Those who experienced particular difficulties were often the voters with little computer experience, senior citizens, voters from lower income brackets and African American voters. The researchers found that such factors in fact influenced voters' ability to translate their voting intentions into votes with accuracy (Hernson *et al.*, 2008:16).

Mediated actions, effects, and artefacts

A system which relies on human vote-counters, and an automated system, are differentiated by the role of interpretation in discourse. When people speak to one another, their utterances can refer back to their own statements, and this is called a 'self-linked' conversational contribution. Alternatively, they can respond to the offers and demands of other participants in the conversation, this is called an other-linked contribution (Gunnarson, 1997:290). In contrast, the automated cohesion in software is always self-linked –the system defines both valid input and the possible responses.

The discussion of voting systems above showed the importance of *mediated action*. In subsequent chapters, I will consider how the non-negotiable nature of mediated actions in software can carry a very strong modality and consequently plays a particularly important role in defining what is considered 'real' in an interaction. The interactive features of the software, or its procedural resources, generate all mediated actions.

Mediated actions include, on the one hand, the transient responses of the system, which I will term *software effects*. These may include marking a candidate with an 'X' on an interface, changing the value of a variable, or displaying a confirmation screen. On the other hand, mediated actions are used to produce *software artefacts*, or the persistent texts or records of interaction (such as the data that represents the 'vote' in the voting system discussed above). Software artefacts provide a permanent record of an interaction and are not necessarily perceptible to users. They are important phenomena which indicate the writing-rights and distribution of power within discourse, and suggest the designers' priorities and social interests.



Figure 7.1: The class BUTTONCLASS is defined by the Windows CE Application Programming Interface

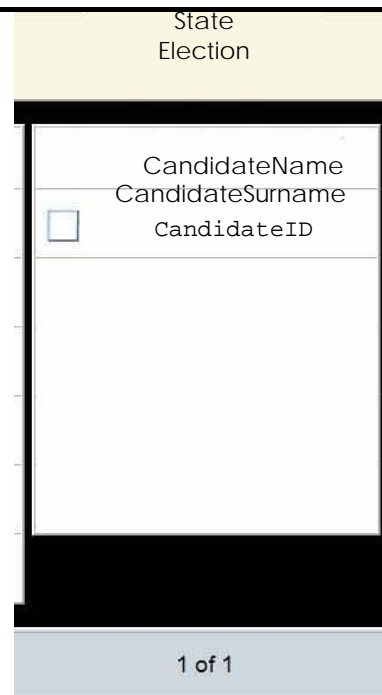


Figure 7.2: The rules for creation of check box objects is defined with the parameters of the Windows CE API CreateWindow function

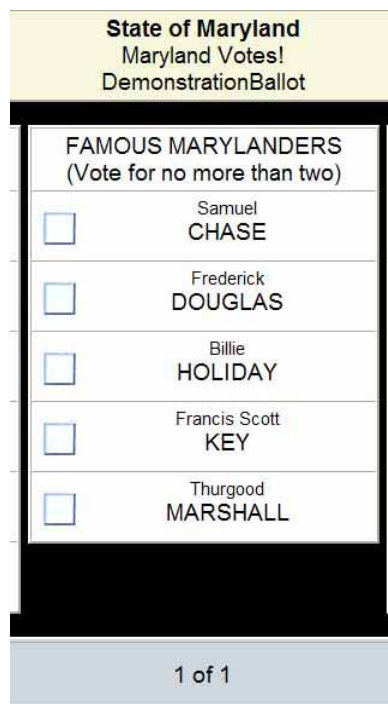


Figure 7.3: The check box objects are instantiated and populated by test data for a mock election

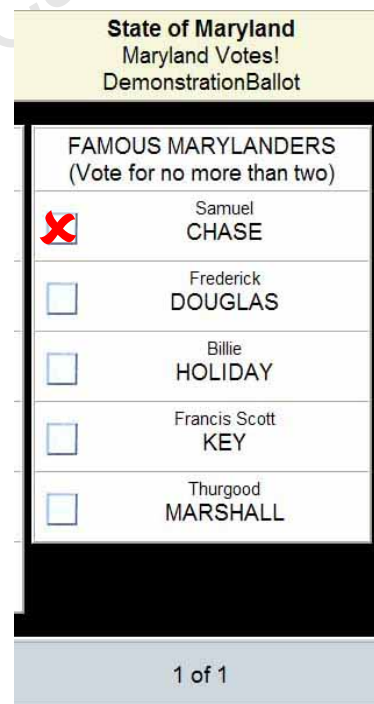


Figure 7.4: The user's selection toggles the state of the check box

Figure 7: Composite design – the construction history of check boxes in voting software – illustration derived from screenshot in Bederson et al. (2003)

Direct manipulation of objects

'Direct manipulation' interfaces in software originally referred to the combination of a graphical user interface and a cursor, controlled by a mouse or some other pointing device (Schneiderman, 2003). With a touch screen device, the simulation of direct contact with the software representation is intensified, since the software responds when users touch the screen (unless the touch-sensitive surface is worn out). This is a simulation of directness. In the voting system, the user's apparently direct touch is mediated by hardware, several 'layers' of code and at least two (clashing) metaphors. One metaphor, that of a simulated ballot, speaks to the user, via the graphic user interface. Another metaphor governs the coded operation of the check box as a user interface object created with the Windows CE API.

A field usability evaluation of the voting software found that about 8-10% of voters found it 'difficult' or 'somewhat challenging' to change their vote, and that these voters were primarily those without much prior experience of using computers (Bederson, *et al.* 2003:7). According to the researchers, if users wanted to change their vote in the single-candidate race, they need to 'toggle' the first check box to an unchecked state before they can vote for another candidate. This is not something that characterises paper ballots, and there is no representation of the new affordance in the interface. The same user action that is used to turn the check state on is used to switch it off. The same action which works to select one candidate does not work on another. The graphical user interface makes the features of the software discoverable and accessible to the user, but this particular feature would only be discovered by exploration. To make matters worse, the voting instructions cannot be accessed from the voting screen.

This usability problem speaks of a mismatch between the simulation of voting in the interface, and the way in which the action of voting is simulated in the software. This mismatch suggests that the system programmers primarily imagined the users interacting with the coded objects in the interface, and did not focus on creating an interface that represented the action of voting.

Users are likely to think of voting as something that people do, perhaps by marking their choice of candidate on a paper ballot, and the visual appearance of the Diebold voting application supports this interpretation. The user interface suggests a visual metaphor of a paper ballot through its (somewhat rudimentary) graphic design. The user steps right into this imaginary space, courtesy of the illusion of 'direct

manipulation' generated by a touch screen interface, and participates in a simulation by 'touching the ballot' in order to make a mark.

By contrast, the object-oriented voting system simulates the act of voting by recording the user's selection as an attribute of a check box object. 'Did she vote for the first candidate?' becomes 'Ask for the value of the 'checked' attribute on the first check box and decide if it is equal to zero'. The object oriented paradigm of programming simulates the world as a collection of 'objects' (bundles of variables and operations on variables) that act by sending messages to one another.⁸

These two metaphors clash when the application's appearance is inconsistent with its behavior. The clashes in metaphor are closely related to the linguistic phenomenon of 'grammatical metaphor' (Halliday and Martin, 1993) or 'semiotic metaphor' . (O'Halloran, 2005:119). As Halliday (1993) explains, grammatical metaphor is a cornerstone of the specialised technical discourse used in most academic disciplinary knowledge, and it is found in almost all institutionalised and written registers of language.

Halliday provides the following example of grammatical metaphor from a clothing label: 'prolonged exposure will result in rapid deterioration of the item' (Halliday, 1993:112). Here the use of the nouns 'exposure' and 'deterioration' hides who is doing what, and objectifies the processes as things. This is an example of the grammatical metaphor known as 'nominalisation' . As Halliday explains, the prototypical meaning of noun is 'a thing' , and so where a process is represented with a noun rather than a verb, that process comes to be objectified. There is a metaphorical transfer from the grammatical rather than lexical meaning of the word -- 'reality comes to consist of things rather than doing or happening' (Halliday, 1993:112).

Mathematicians and scientists rely heavily on such processes of nominalisation which extend to the use of images and symbolic representations in these disciplines. Nominalisations and other semiotic strategies all work to give substance to otherwise 'metaphorical constructs' which are made to appear as 'real entities formulated in exact symbolic terms' (O'Halloran, 2005:199). Similar processes are at work in multimodal software interfaces, although they are not always immediately apparent. To illustrate this point, I will present a short symptomatic reading of check boxes in the

⁸ The objects are in fact specific instances of generalised classes of objects.

voting application, in order to sketch the complexity of analysing an interface created with current programming methods.

While the voting ballot suggests the meaning of 'making a difference' and mentions the party that is to be chosen, the help provided by the electronic ballot focuses on the user's process of interacting with the objects in the interface, rather than participating in the democratic process.

Composite procedures

As explained above, the layout of the South African paper ballot seems to suggest the temporal sequence of dialogue, by representing the offer- response pattern of the dialogue between ballot and voter in the left-right organisation of the page. This meaning is not apparent in the check boxes provided by the voting software, or the staid, centred layout of the ballot page.

Notably, the range of visual semiotic resources is significantly narrower in the software interface than in the South African ballot, with no party logos or leaders' photographs in the display. The exclusively verbal representations of candidates also significantly narrows the audience addressed by the ballot, and reduces the ideational and interactional meanings about the parties that are made available to voters. In the software interface, the check box is arranged to the left of the candidate, the candidate's name is centred and the surname capitalised, and there are no visual representations of any of the candidates, or any indication of their party affiliation. The primary framing of the page designates the offer of the three separate ballots and their coded functionality, rather than the implicit sequentiality between the offer of the parties and the space for a response in the single-ballot layout.

The colourful logos and the friendly address of the photos of the party leaders is the most salient element of the design of the paper ballot. By contrast, within the software ballots, the three dimensional check boxes 'jump out' of the two dimensional design of the page, which is given visual identity by the row of visually identical check boxes balanced by the row of centred names in each ballot. Grammatically then, the ballot offers a distinct set of parties and a chance to vote, while the software is offering an opportunity to interact with a system, and to make a selection from a list of visually indistinguishable and interchangeable candidates. These differences certainly speak of the different meanings of an election in the two contexts – the first experience of universal franchise in a new democracy, as opposed to the anonymous routine of civic duty, where democracy is business as usual.

Many of the differences between the two designs also relate to the different regulations which govern the designs. Both ballots are legally regulated. In the appearance of the South African ballot there is a formula, or a rule for the components which parties may include to represent themselves on the page. There is also a formula by which the individual parties are arranged (a lottery for the prized first position). Figure 7 indicates that the electronic ballot is generated from at least four generations of procedurally encoded rules by which interface controls are put together for graphical user interfaces.

In software, the semiotic history of the source matters. Source code creates an interactive text which is brought to coherence through the user's interpretation of visual, verbal and procedural (or algorithmic) cohesive ties. Halliday and Hasan (1979:4) explain that the use of cohesive ties creates the semantic unity required for a text to be perceived as a single whole, rather than as a random collection of unrelated elements. Once executed, informational code creates interactive cohesion, by linking or dynamically computing connections between interface elements, user commands, and system responses (Aarseth, 1997). At the same time, the source still has a meaning in relation to the context in which it was first forged, or where it was adapted to new purposes. In this sense, the source structures the software text (in this case the check box) in profound, though invisible ways.

Figure 7 depicts the history of the check box in the voting application, Modular design processes and customisation have shaped its visual meaning; thus ultimately changing the experience of the voters who use the software. As illustrated in Figure 7.1-4, the check box control customises a default auto check box from a 'class' specified in the Windows CE Application Programming Interface (API). According to the conventions of object oriented programming, this class specifies the abstract rules by which the control is constructed. Most applications are assembled from a selection of these controls, which are used much as children build unique designs from the basic building blocks of a Lego set.⁹ The controls are built as instances of a general abstract 'class' of objects. Unlike Lego blocks, though, classes are abstract

⁹ Pre-made user interface controls are used by programmers to assemble a graphical user interface, and to speed up programming. They also create predictable behaviour and provide a cohesive appearance for applications on the same platform, thus giving operating systems the characteristics of a branded 'channel' for software distribution, development, and use.

rules, a set of rules which specify a basic visual appearance and handle input-output functionality. This framework can then be customised for a variety of purposes. Software interfaces and functionality should thus be analysed as composite, collaboratively authored objects. It is worth paying attention to these internal dialogues. The classes constitute a built in set of 'rules of communication' that set default values and tend to determine the bounds of customisation of any application which uses the class.

In the voting software, each check box is presented as a visual unit with a written caption, reflecting the coded structure of the check box object. In the API, the caption is an attribute of the check box structure. The specification in the Windows CE API thus assumes that all choices of this nature will be choices between textual items, and thus projects a literate user for this control. Microsoft provides an explanation of the CreateWindow function which explains that the attribute 'lpWindowName' is used with the style for auto check boxes 'to specify the text of the control'. If the designer wants to use images in a check box control, they would need to undertake the more awkward approach of combining a check box with an icon or static control, or coding a new multimodal class from scratch.

Within the limitations of this formula, Windows CE provides programmers with a wide range of choices on how to configure the check boxes. The application's designer and programmer determine the size and shape of the check box as a pattern, how it will be repeated and laid out on the screen, and how the visual appearance of the button will be integrated with the local data needed to administer the election. The page design consists of specifying rules for layout – when the application loads the election data from a database, how will the space be populated with the check boxes? What window and screen size can be assumed?

In the automated version of the ballot, the check box control is positioned left, thus coming 'first', possibly suggesting the fact that, from the designer's perspective, the check box is 'given'. The caption or label may be treated as 'new', because it is a parameter which will be added later, by the software developer or election officials. Although Microsoft's design blueprint for the class allows check boxes to be styled to the right, the default setting of left alignment prevails, indicating the power of default settings. While the paper ballot suggests the sequencing of the voter's response to an offer on the ballot, the user control on the electronic ballot suggests the sequence of designing the control and then later populating its instances with data.

The vertical lines in the design divide one check box from another, rather than dividing a space for offer from a space for a response. The centring and capitalisation of the candidate names suggests that a designer was trying, within the constraints of the somewhat limiting original blueprint, to give a visual dimension to the text-only design rules, and thus to make the political meaning of the election emerge from the anonymity of the rule-based layout.

Personalisation or categorisation

A key difference between the two ballots is the different approaches to language which they reveal. The South African ballot is a feast of tongues, a document which addresses a public and tries to employ rules of representation that will allow it to 'speak' to all citizens at once. By contrast, the voting software addresses a voter as an individual member of a category (registered voter, Spanish speaker), and screens its customised communication from other citizens. While the South African ballot makes many questionable assumptions about language (as suggested above), I wish to address, in particular, the assumptions coded into the structure of the voting software.

In monoglot societies, it is common to imagine that languages are completely different entities, and to imagine that everyone speaks one language, which they use for all purposes. The reality of multilingualism for many people around the world is very different (Blommaert *et al.*, 2005). Monoglot assumptions are reflected in the design of the voting software, which gives users one opportunity to 'code-switch' from English to Spanish right at the start of the process. It then takes them through the rest of the voting procedure in the language that they have chosen, thus screening them from the presence of the other language, and also, of any awareness of the speakers of that language.

The South African ballot employs a range of linguistic strategies simultaneously. Some parties present their names bilingually, and others code-switch within their names. Strangely in a country where fewer than 10% of the population speak English, all the parties present at least part of their names in English. The linguistic decisions made by the parties are deliberately chosen to give them the best chance with the electorate. They are also historical artefacts of the party's political identity.

Were the voting software to be adopted in South Africa, how easily could it be adapted to the local context? A key limitation of the software arises from the check box object which is used to present the information about each candidate. The need

to address all citizens in a developing country, and the complexity of the multimodal and multilingual South African party information does not map onto the basic structure that has been defined at operating system level for the check box control. While the availability of an interface for non-sighted users would be an advantage, the entirely separate stream of audio also suggests several assumptions about users. In the first place, it equates reading with sightedness, an assumption that does not hold even in the U.S.A, where many sighted people would benefit from being able to access information in a form other than plain written text.

Conclusion

This chapter used the semiotic analysis of an electronic voting system, and a paper ballot to explore the implications of the particular mode of production of software as a medium. Software is a mode for media production (or the production of semiotic representations) which delegates certain productive rights and responsibilities to the user. Which rights are allocated to which users, and under what conditions, is determined by the source code which is the interface to the application for the software's designers.

The nature of software production processes brings about particular relationships between designer and user. Relationships are established through the high modality of encoded procedural resources, and the concealed mediated actions as specified by source code. They are also expressed by controlling and permitting what user actions are possible – or the structure of interactivity in the software. Software is a procedural representation (or simulation) of the user's projected activities which often projects and assumes a coherent world order. A second person perspective helps to foreground the ways in which this is used to convey the interactive and textual meanings of communication.

This chapter has outlined some ways of representing and analysing software as procedural genre which simulates discursive interaction through the syntagms and paradigms of encoded communicative events. These patterns set the conditions for users' intended actions, or illocutions. In this way, they shape the user's experience and simulate wider social patterns of interaction. Procedural genres always suggest particular relationships between those who make the rules, and those who are governed by them. These relations are expressed particularly clearly in the norms which govern the production of software artefacts.

Computerised voting systems are controversial because they are centralised media systems, which offer anyone who controls the software channel (or can gain access to it) significant potential social power. The systems must be trusted with the power to communicate effectively with every citizen of a country, to interpret and record each citizen's voting intentions truthfully, and to translate these instructions into mediated actions that are given the power of full social performatives. When aggregated, the recorded votes can determine the social future of a country. This chapter has shown some of the difficulties with current systems. The potential for abuse and the temptations for political and other players to engage in the wholesale theft of democracy is startling.

The comparison of the semiotic resources offered by the two voting systems has suggested that a move to computerisation would not necessarily be a more effective way of serving the interests of South African voters. Understanding the uses of semiotic resources in paper ballots and current systems of voting by using the techniques suggested in this chapter might provide an alternative starting point that could help to realise what is being gained or lost (and who might be gaining or losing out) in the change of media. A social semiotic analysis can highlight the awareness of multiple languages, switching between languages, and the role of visual meanings in the ballot. It can also identify the implicit communicative event simulated by the ballot, and the set of norms for interpretation which constitute the felicity conditions for voting. Similarly, an awareness of the importance of contextual meanings can highlight the fact that the individual's mark on the ballot is only part of the experience of voting. In the South African context, voting is also about individuals participating in a collective action. The design of the voting software used in Maryland reduces the sense of being part of a collective, and this might be even further reduced by the introduction of e-voting systems. A shift to e-voting (where voters vote from home) might make a different kind of democracy possible, but there would be significant losses as well. In particular, certain political meanings would be lost in a switch to the monoglot, monomodal and individualised experience assumed by current U.S. systems.

Software's mediating and performative role in discourse allows it to provide resources for meaning-making across all the semiotic metafunctions. Software's ideational metafunction is primarily numerical, since it relies on numerical representation to simulate other human semiotic resources and to process them through logical and mathematical operations. Secondly, by specifying the 'rules' of communication, particularly by defining what software users can and cannot do, and who can and

cannot access the channel of communication, with what powers, software can draw on and enact a wide repertoire of interactional meanings. A key addition to the verbal resources which govern interactions is the visual relations of surveillance and privacy. In the past few decades this has given rise to a range of communicative genres. Finally, since processes of quasi-semiosis govern software as discourse, the textual function of software centres on automated cohesive relations which generate procedurally defined texts, created collaboratively by several generations of designers, as in the case of the check boxes discussed above. Software's source code uses self-linked structures of automated cohesion to define data and functions, to model systems, to generate and organise graphical displays and to sequence procedural interactions. Mediated actions, effects and software artefacts are terms I have suggested in order to refer to the distinctive text-making resources associated with the automated cohesion, or quasi-semiosis of software. The performative aspects of mediated action give software a powerful ability to define the 'real'.

The encoded dialogic procedures and monitoring possibilities of software shape our social surroundings. This study investigates two specific contexts to explore how the simulated discourse of software is used within people's communicative interactions and how its rules and procedures relate to other situational 'rules of speaking'. While the significance of each sequence of discourse is considered individually, the examples are also compared, to show the role of the simulated conflict in each context. Based on these insights, Chapters Five to Chapter Seven choose a sequence of discourse mediated by software. I analyse the sequence as a simulation in relation to the following questions:

- What is simulated?
- How does the simulation contribute to the communicative event?
- Is there a quantifiable goal or outcome to the simulated conflict?
- What are the goal and manipulation rules in the simulations?
- What role does the outcome play in the overall communicative event?
- Are participants aware of the rules of the simulation?
- How do participants represent these rules?
- What rules are hidden from some or all participants?

The mediated actions, effects, and artefacts generated by the use of the software are discussed in relation to the following questions:

- What transient system representations are produced by user interaction?

- What persistent system representations are used as signifying resources in the design?
- How do users customise and modify the interfaces?
- What artefacts does the software record (in digital media) or produce (in other media)?
- What persistent media do users produce in and around this discourse?

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Chapter 3: Studying software in use

Zahid, Piet and Tyrene¹⁰ were playing the search game. The boys typed their friends' names into the address bar of Internet Explorer, and clicked through to the top result, which appeared on the localised South African version of the MSN 'live search' site. The amusement of the game was provided by the juxtaposition of their own names with the incongruous identities that 'matched' their names, according to the search engine. The boys would double over in stifled laughter at the unlikely results of these 'vanity' searches. The websites served as visual insults traded between friends in a game of identity and masculinity.

Piet typed in the name 'Zahid' and the top match was to a blogger site. The other two friends jeered as they pointed at the stylised graphic of a 26 year old male from the UK. Zahid jeered back in return, pointing out the details of the profile – 'I'm not 26 years old, man.' On a scale of insults, this one was not exactly withering.

The next site hit the mark. The top match for Piet's name was the website for a South African band. Labelled an 'Official Entry Portal', the home page they opened had a black and white crotch shot of a girl in designer underwear, with a diamond ring in her navel. The band's tagline was in Afrikaans, and translates roughly as 'Wild boy – wilder than the game reserve'. The Afrikaans word *klong*, used in the tagline, can also be translated as a derogatory term for 'black boy'. Piet was now the butt of the joke, and closed the browser window, pulling a disgusted face. His gesture was disavowing something about the page, although it was not clear if he was responding to the verbal message or the visual crotch shot. Zahid responded to the visual meaning of his friend's gesture and jeered at Piet's assumed prudishness, observing to me, 'He lie Miss, He got porn'. Piet responded to this betrayal by opening the browser again, and typing the word 'porn' into the address bar. Apparently he was more concerned about responding to his friend's contemptuous accusation than about what I might think, or that his teacher might see what was going on. He clicked through to the top result. The website was labelled 'A South African Mega Hardcore Porn Site' and

¹⁰ All of the names used in this study are pseudonyms.

included a collection of relatively explicit pictures of naked blonde women on its home page. Piet had effectively silenced all of us with this daring performance. You could see he knew he had 'won', as he smiled and closed the browser window. I was somewhat shocked. Piet had made his point. He responded to my warning by offering to show me his rather more innocuous collection of car pictures (which the boys hoarded like trading cards).

In this incident, Zahid, Piet, and Tyrene traded MSN search results as 'turns' in their game of friendly insults.¹¹ This story raises particular methodological questions related to the study of meaning-making in mediated discourse. The boys were playing their search game in the school computer lab in their primary school in Athlone, Cape Town, where I was observing their Grade 5 class's literacy lesson. A more detailed discussion of the school and the context is provided in Chapter 4. For now, I would like to use this incident to raise certain key theoretical and methodological issues associated with this study.

I was somewhat shocked to see the 'Mega Porn' website appearing on a screen in a primary school computer lab. As a researcher and an observer I was a participant in this particular social interaction, and afterwards, I felt an uneasy sense of complicity and considered saying something to the teacher or principal about changing the default settings on the search engines to 'safe search'.

Nonetheless, after stepping back a bit from this initial reaction, I could see some of the other potential meanings in this incident. In this exchange, the queries to the search engine are complex communicative acts, where the boys are interacting with one another in a verbal game of humorous banter and playful insults, and testing their bravery in a series of gambles and dares. The images which the boys saw on the websites are given a new and contextual meaning in the exchange. The boys treated the images as objects with particular powers and meanings that they could use against one another. By showing us the Mega Porn site, Piet was possibly signifying that he could be the 'knowing' adult male who could look freely at pornographic images of women and prove that he was daring enough to flout adult authority (and entertain his friends) with this transgressive act.

¹¹ The narrative version of what happened is constructed from my field notes and a video clip of the exchange. A transcription is provided below.

Whose meanings prevail in this exchange? This question is always at issue in studies of media. It concerns the circuit of culture and it involves the power of media producers to set public agendas, and the ability of audiences to actively remake the messages they receive. The question of media-audience relationships have become more complex, because software is a medium where production and reception converge, and where interpersonal discourse and the consumption of media texts are interwoven. This is suggested by the way the boys' banter includes a mediated interchange with the search engine. In addition to the boys' banter, and the images they saw, it is necessary to consider the editorial decisions of the search engine and the school network, which together mediated the exchange.

This chapter reviews a selection of methods from a range of disciplines that have been developed to study people using software, and explains the rationale for the choice of methodologies for this particular study.

Methods of studying software in use fall into two major groups: studies which analyse and evaluate the design of software products, and studies where the lens shifts to more naturalistic observations of software users as people interacting in particular social contexts. Both of these methods are needed to make sense of sequences of discourse mediated by software. The political economy of the software industry is a seriously neglected topic, but provides an important context for investigations of the intentions of software designs and the activities of software users (Van Couvering, 2004; Buckingham and Scanlon, 2005).

Changing circuits of culture

The relationship between the various 'moments' in the circuit by which media is produced, distributed, and consumed is a key issue for media studies as a whole. Methodologies which have evolved to address a single moment in the circuit need to adapt, since production and reception are no longer two distinct and easily identifiable moments. These formerly separate moments are converging in certain ways as the relationship between media producers, media products (or 'texts') and audiences become increasingly conversational. In addition, the relationship between media producers, texts, and audiences is now increasingly mediated by software. As explained in Chapter 2, software can simulate or 'remediate' older media, but it also provides the procedural resources which allow software to function as an interactive medium of distribution and production.

This same shift has given rise to the 'convergence culture' currently associated with participatory media in the world's dominant economies (Jenkins, 2006). It is also the key to the immense power of new media sites such as Google, Yahoo, MSN, YouTube, Facebook, and popular massively multiplayer online games (such as World of Warcraft and Lineage).

Traditionally, studies of media focused their attention on different 'moments' in the 'circuit of culture' (Du Gay *et al.*, 1997). In the past, the separate stages of this circuit between media production and reception were easily identified, and were associated with very different research methodologies. The discrete nature of media products such as books, magazines, or feature films allowed easy differentiation between the various 'moments' in the circuit and also encouraged a focus on the texts as discrete artefacts and as cultural forms. Studies of the political economy of the media industry, its economic relations and production practices, were traditionally methodologically and theoretically distinct from reception ethnographies (the studies of audiences using media in their daily lives). They are also distinct from yet another set of studies, which focus on the critical or semiotic analysis of media products, or 'texts'. As Strelitz (2000) points out, these different theoretical traditions tend to emphasise either the social relations of control or of resistance, according to their choice of a site of study. Which (and whose) meanings are 'dominant' or 'preferred' in society, seems to depend on whether researchers focus their attention on the power of media producers or the audiences who appropriate media for their own purposes.

These 'moments' are now no longer so easily separated, as suggested by the example of the boys and their 'insult game'. The boys are engaged in a contest of insults, during which they produce media with the encoded circuits of the browser and search engine, which direct them to a website which markets hardcore pornography.

Figure 1 below is a schematic depiction of some of the circuits of production and reception that come into play in the boys' game. In the first circuit, to the left of the diagram is the mediated exchange with the search engine that forms part of the conversation between the three boys, in this case the sequence between Piet and Zahid. I have labeled their interactions with the browser and the search engine interface as the 'user circuits'. The boys 'produce' or at least 'direct' the game for their own purposes, fitting the search results into an overarching genre of conversation which resembles a verbal contest. They are engaged in media

production, in that they produce a query and use the search engine to generate a unique interface to the web, in the form of the page of search results.

The search engine is used as part of an insult game that they are playing together. Although the boys search via the address bar of their browser, and do not seem to distinguish between the browser and the search engine, they have devised their own multimodal rhetoric, which they deploy in a turn-based multimodal conversation. The search engine itself is a collection of resources designed to assemble the search results page, but it is unlikely that its designers imagined that it would be used in exactly this way.

On the right of the diagram is another circuit which is encoded to support the transactions between search engine, websites, and advertisers. The search engine is commercial proprietary software, and so I have labeled these mediated connections the 'owner circuits'. Microsoft owns the source code which decides which sites are indexed, and displayed, and how advertisements are interleaved into the mix. The owner circuits, including the source code, are Microsoft's 'owner interface' on the interaction with the boys, and with millions of other searchers. From the perspective of the search engine, the boys' activities are 'traffic' which can be monetised, and their interests, as expressed in keywords can be sold to the highest bidder. While marketing websites and online publishers jockey for the first few positions in the search results, the search engine's keyword advertising program sells query terms. A third circuit, the information about the boys' activities is fed back to the search engine. The MSN server produces a log recording the 'clickstream' of all the boys' keystrokes, which will later be 'data-mined' for information about customer behaviour.

At the centre of the diagram, Web and Internet protocols, network connections, and Google's software and hardware provide mediation and adjudicate the contest between all the websites that match Piet's query. These results open a custom channel via the search engine to a set of websites that match the query. These procedures could be called the channel circuits. In fact, the media product, or search engine 'text' is itself a complex economic and procedural transaction generated by a cloud of agents spread across a global network (including, for example, the creation of hypertext structures by armies of web authors around the world, the engine's selection and ranking of results, the auction of keywords to advertisers, the indexing process, and the search engine optimization business).

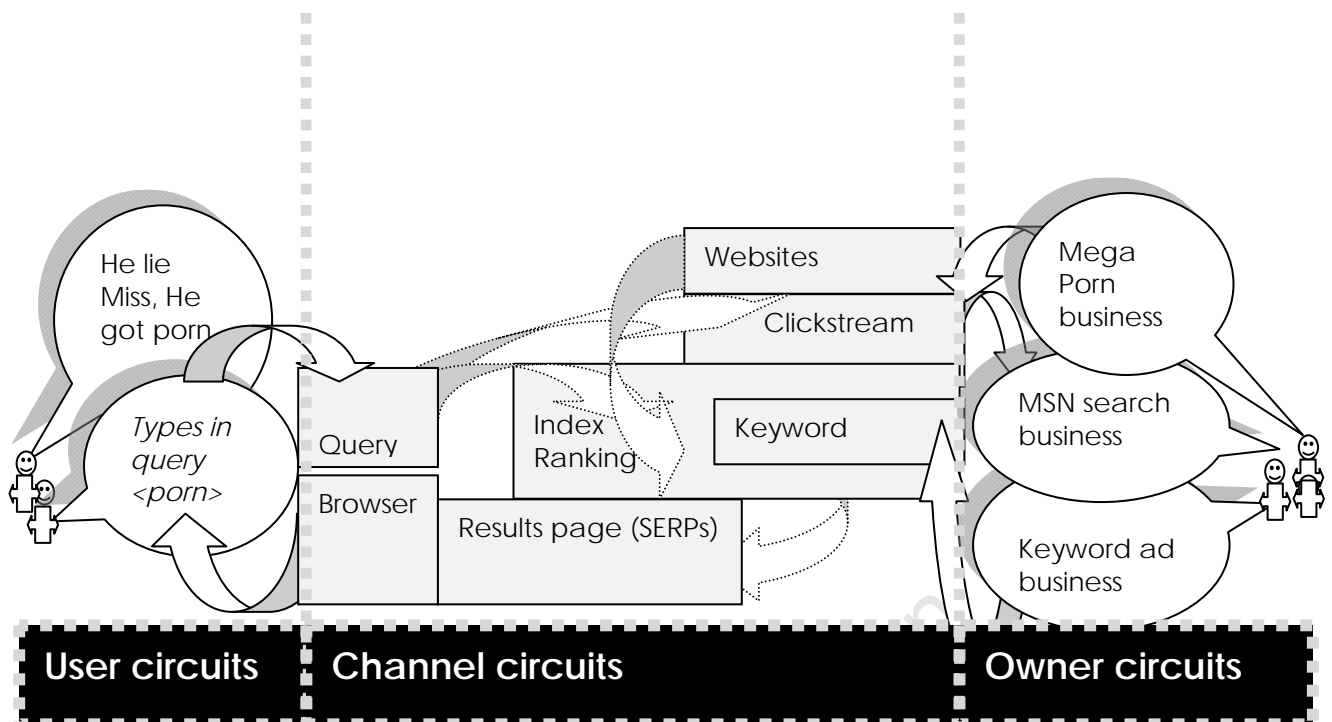


Figure 1: Simplified production-reception circuits in children's search transaction

People have always watched or listened to media such as television and radio while they engage in other social interactions. Similarly, the transactions and interactions of media producers as they fight for consumer eyeballs are well documented. The new circuits of production are the user, channel, and owner circuits which turn producers into receivers, and receivers into producers.

Social semiotics is a theory designed to help to analyse the semiotic design of particular texts (e.g. Kress and van Leeuwen, 1996; Lemke, 2002). The analysis of the voting ballots presented in Chapter 2 exemplifies some of the strengths and the limitations of this form of textual analysis when applied to software. The researcher can speculate about what a design 'means' or how it 'works', but this may be very distant indeed from how the software designers have programmed it to function, or how its users experience it in relation to their own 'designs'.

Figure 1 suggests that an analysis of software texts should be able to account for the procedural circuits by which search results are generated – an analysis should take account of how websites are accessed, indexed, and archived, how search engines allocate rankings to pages, and how advertising and marketing messages are interleaved into a design. Designers, programmers, and marketers in the search and web development industry on the one hand, and the searchers on the other hand, both constitute distinct moments for study. Here a researcher can attend to the fact

that software texts serve as the channel which connects these two moments, usually in simulated conversation or surveillance, but also in the discursive methods of software development, such as user-centred design, beta testing, and playtesting in the games industry.

The design of the software is given a new significance in relation to the user's designs, or her intentions in using it. As explained in the Introduction, an individual's surroundings include her 'environment of communicative possibilities' (Jones, 2002:11-12). In the case of the two boys, the images are silent, and thus screened from their teacher, allowing them to break the school rules. The interface of the web browser is another screen, which obscures the identity of the participants in this particular conversation, hiding the logic and social interests of the software designers from their users, and conveniently hiding the age of the boys from the sites they visit.

This study focuses on the 'end users' rather than the owners of proprietary software, and acknowledges that software in use gains significance as part of a specific social situation, which can include the procedures specified by software designers. This chapter explains how methodologies of discourse and conversation analysis can help to account for the intersections between these conversations and circuits of mediation.

Studying products and designs

The following discussion outlines the range of research methodologies which have been developed or applied to study software in use, and indicates how these were useful to this particular project. Human-computer interaction (HCI), new media studies, social semiotics and multimodal discourse analysis all share a general preoccupation with the design of the software artefact, although their theoretical and methodological assumptions are very different.

Social semiotics and multimodal discourse analysis

The study of software as 'multimodal discourse' in social semiotics and discourse analysis focuses on software as a design. As explained in previous chapters, in the social semiotic approach, a design is read symptomatically, as an expression of the social interests of its producer (Hodge and Kress, 1998). Recently, researchers from this field have used this methodology to analyse certain forms of software, primarily hypertext, with the aim of understanding the role of different semiotic modes within a design and the kinds of coherence created between them (Lemke, 2002; Kok, 2004).

A key motivation in social semiotics has been to be able to explain the textual and generic characteristics of games and online texts in order to inform school media literacy curricula and teaching within English and Media Studies (Burn and Parker, 2003; Burn and Durrant, 2007). These researchers share a focus on the design, or construction of the software artefact, and acknowledge the potential social power of certain types of designs. They draw on cultural studies and also investigate the contextual meanings of a game or piece of software.

As Lemke's useful analysis of the meanings of a science website indicates (2002), a social semiotic analysis offers a powerful way of explaining the workings of a designed artefact and suggesting its potential meanings. Lemke generalises his 'reading' to all potential users of the site, and this is the major weakness of the method.

In the case of the insult game between Zahid, Piet and Tyrene, social semiotics would have been particularly helpful in understanding how the images on the websites have a more powerful meaning than the written legal disclaimers in the exchange. The power of the images on the websites played a central role in shaping the interaction. The websites offer a set of meanings associated with the semi-naked and naked female bodies that they depict. In the search engine results the page description contains a legal disclaimer which Piet ignored: 'Warning: This is an adult site. You need to be over 18 to enter.' On the 'Mega-Porn' site itself, the women are photographed according to pornographic conventions, entirely naked (apart from their heavy make-up). They gaze out of the image directly, implicitly addressing whoever happens to look at them as a potential sexual partner. A smaller set of images on the page offers the site's contents, and bold text shouts in capitals 'Free Porn' and 'A South African Mega Hardcore Porn Site'. At the foot of the page, a tiny line of text repeats the legal warning, in the visual equivalent of an aside, or a whisper 'This is an adult site and you need to be 18 years old to enter.'

As an analytical method, this kind of analysis can generate significant insights as long as the researcher avoids making overly general claims for her reading. The encoded design of software is an illocutionary act by the designer, which will be 're-designed' every time someone tries to use it. For example, it is likely that the children did not understand all the sexual meanings of the images they saw, and hence may not have interpreted the naked women's gazes as offers. As Buckingham and Bragg (2004:124) point out, younger children tend to interpret the meaning of sexualised images primarily in terms of nudity.

Back to the source: New media studies

From another disciplinary tradition altogether, the study of 'new media objects' focuses on the aesthetic appreciation and criticism of software artefacts, and uses analytical methods comparable to those of film, literary or art criticism (Manovich, 2001). While the primarily aesthetic orientation of many studies in this tradition is not entirely relevant to the purposes of this study, these theorists, following Manovich, assume the valuable stance of 'digital materialism', because they understand that the procedures of digital representation play a significant role in the construction of software, and cannot simply be 'bracketed out' of a discussion of a new media artefact (Mateas, 2005:101).

Mateas defines the concept of procedural literacy as 'the ability to read and write processes, to engage procedural representation and aesthetics, to understand the interplay between the culturally-embedded practices of human meaning-making and technically-mediated processes' (2005:101). Mateas argues that analysis which does not consider the workings of procedural or source code is merely looking from the outside at a 'black box' whose inner workings are indecipherable. For him, the programmer's source code is the 'original' text and the software it produces is the equivalent of a translation:

Code is a kind of writing; just as literary scholars would not dream of reading translated glosses of work instead of reading the full work in its original language, so new media scholars must read code, not just at the simple level of primitive operations and control flow, but at the level of the procedural rhetoric, aesthetics and poetics encoded in a work (Mateas, 2005:102).

The methodologies of digital materialism thus provide techniques for an interpreter to 'read code' and thus elucidate procedural meanings of a software artefact. In the case of proprietary software, accessing these meanings will require a symptomatic reading of the interface in use, as the source code is not available, and its structures can only be inferred from aspects of the software's behaviour. For example, such an analysis might be applied to the MSN search engine algorithms (or strictly speaking 'neural nets') which performed the editorial function by serving up results for use in the boys' insult game. The exact details of how these technologies work are proprietary secrets, but their symptoms are read carefully by web masters and search engine optimizers. They also entail a range of value judgements and social beliefs and determine the default values for the search, as will be discussed in Chapter 5.

Most noticeably in this situation, the search engine presented customised results because the boys were in South Africa, but delivered them hard-core porn on the assumption that its default users are adults. Both decisions have clear commercial motivations.

Critical incidents: Human Computer Interaction

The academic discipline of Human Computer Interaction (HCI) has historically emphasised the study of 'usability' and of software as a design, or product. In contrast to the two methods discussed above, researchers in HCI study the design of software, as it is communicated to users. Here the objective is usually to study a small group of people using software in laboratory trials, in order to see how easily and effectively they are able to use the product to complete a set of pre-defined tasks (for an overview of this approach, see Preece *et al.*, 2002). Although HCI practitioners are admonished to 'know the user', in most cases, user studies are planned as evaluations of a design.

The goals of many user studies are to identify aspects of the application where users 'get stuck', or experience difficulties that are known as 'critical incidents'. In laboratory-based studies, a small group of users are taken through a set of pre-determined tasks under 'controlled conditions'. A maximum amount of data is recorded during such sessions, with two or three wall-mounted cameras recording user behaviour (one camera recording facial expressions, another capturing mouse and keyboard activity, and another recording the participant's body language).

The edited video records of these 'critical incidents' are used as a corrective for development teams who, like the developers of the voting systems discussed in Chapter 2, tend to focus on the internal details of how their system works, rather than on how users understand the system.

Despite the large amounts of video data and the software logs, observers in usability labs still cannot tell 'what users are thinking' and must make inferences from multimodal cues such as the users' actions, expressions and body language (Preece *et al.*, 2002:365). To address this issue, users are asked to 'think aloud' and in some studies, eye-tracking data records patterns of eye fixations and is added to the video recording so that designers know which part of the screen is receiving attention from the user at any one moment. In some cases, rather than being expected to 'think aloud' in an artificial monologue addressed to the camera and hidden researcher, users work in pairs and their conversation expresses a kind of 'co-discovery learning'

which is particularly valuable to developers (Buur and Bagger, 1999:63). Unlike the ethnographic studies discussed below, there is little sense that the users' discourse might not be a 'transparent window' onto a well-understood world. In fact, the discourse and actions of users themselves requires analysis, explication, or an insider point of view which can only be acquired by participating with them over a longer period of time and developing an understanding of their social context. This can be explained in relation to the purpose and epistemological framework of such studies and may also reflect the fact that such studies tend to recruit small groups of users from the same elite social groups as the designers.

Nonetheless, the value of the usability data lies in confronting the developer with the evidence of the failures of a design in which they have already made significant investments. A developer from a Novell project comments on his own emotional response to seeing users struggle to use his design:

We've all read about the benefits of usability testing, but until you actually try to sit through two hours of these videos, you don't viscerally understand why it's so important. Watching these videos is exciting and emotionally exhausting. You squirm. And it focuses you like a laser (Friedman, 2006).

Semiotic engineering

The Semiotic Engineering Research Group, and notably De Souza (2005), have established 'semiotic engineering' as a new approach to HCI design, which develops a semiotic epistemology and applies it to the activity of designing interactive systems. The seemingly paradoxical name for the approach ('semiotic engineering') alludes to the traditional description of software design and development as 'software engineering', while staking the claim that software design is a process of communication. The analogy implies that the software designer gives shape and structure to meaning-making practices much as an engineer shapes and structures physical reality.

In semiotic engineering, software interfaces are seen as a 'message' that 'speaks for the designers', usability is seen as 'communicability' and 'critical incidents' are seen as breakdowns in communication with users. To indicate this shift of perspective, in semiotic engineering the software's user interface is personified as 'the designer's deputy'. This creates a clear conversational model, while suggesting the limited authority and creativity of software as compared to the 'designer':

In semiotic engineering terms, the message serves as the designer's deputy, presenting not only an artefact that can perform a certain range of functions and be used within a certain range of contexts, but also the rationale and design principles that have been followed while synthesizing this product (De Souza, 2005:24).

Semiotic engineering foregrounds communication, conceptualises software as a medium, and draws explicitly on concepts from linguistics and semiotics in its theorisation. This particular HCI methodology is sensitive to interactive meaning-making processes, although the communicability evaluation methods that are proposed fit into a laboratory study or usability evaluation. The interpretive 'inspection' methodology resembles a structured semiotic analysis.

No major usability problems or other 'critical incidents' occurred during the boys' search game. The boys did however, use Internet Explorer's address bar to search rather than the MSN home page. In a communicability evaluation, this would have been tagged as 'I can do otherwise' or a sign that they do not understand the 'design solution' provided by the system (De Souza, 2005:138). The boys probably do not understand the role of the search engine home page, and how to use the additional options that it would provide for them, such as, for example, expanding the scope of the search so that the results do not only include South African sites. From the children's perspective, however, they were not 'searching' as the MSN designers might understand the term, but were rather using the browser as a search-enabled navigation tool in a game of chance and speedy repartee rather than within a slow, cerebral and methodical research process.

The incident does indicate the difficulties associated with adopting a semiotic engineering approach, which aims to communicate more explicitly with users about the design rationale for the software. The search engine designers have set their defaults to serve results to a user whom they seem to assume is an adult South African, since they prioritise South African matches while not censoring any of the hardcore pornography. The children exploit this mismatch with their own situation. Communicating with someone requires an understanding of whom you are addressing, and most software is designed around crude demographic categories, or else with the assumption that the user will do the work of establishing who they are and what they need. As Geertz points out, this is the limitation of computers as

semiotic machines. Despite the promises of the industry, they do not allow us 'to understand men without knowing them' (Geertz, [1973] 1994:230).

Field studies of software in social contexts

The contexts in which software is used come into sharper focus when researchers aim to observe and explain people's experiences of using software outside of a laboratory setting.

Multimodal recording and transcription

Jewitt's discussions of children using software in a classroom context (e.g. Jewitt, 2004; Jewitt, 2006) applies social semiotic insights into multimodality as part of a field study rather than a critical analysis. This mode of analysis explores meaning-making as an activity of particular individuals in a social context. Jewitt uses activity theory to account for context, and provides a study of how software texts mediate children's learning in a classroom context.

As Jewitt explains, a multimodal approach requires a method of data collection that enables 'a focus on all modes of representation and communication that are being used'. In Jewitt's work this means that, like HCI researchers, she uses video to document the activities of the teacher and the children during the lesson, and she also records the images and sounds from the computer screen. In the tradition of conversation analysis and discourse analysis, she then provides a detailed transcription of her recordings which helps to generate the analysis (Jewitt, 2006:32).

The tradition of transcribing discourse for analysis is adopted from the methodologies of conversation and discourse analysis (e.g. Van Dijk, 1997). These methodologies have different theoretical and disciplinary focuses, but share an interest in language as a form of social action, which is sequenced and organised in characteristic ways in particular social contexts. (Van Dijk, 1997:2). With the development of discourse analysis, linguists were able to account for the organization of talk and longer texts (Coulthard and Montgomery, 1981).

Jewitt's (2006) work primarily explores the multimodal character of digital texts. This methodology could be applied to the boys' use of the search engine in their insult game, by recording and transcribing all visible and audible signs in the interaction. This technique would allow a detailed analysis of the minutiae of the boys' conversations with one another and with me, and of certain aspects of the 'user circuit' or how the boys interpret and redesign the interface to suit their purposes.

However, the 'channel circuit', or the automated editorial decision that processes the boys' queries and selects particular websites for display in the 'default' positions, and the 'owner circuit' which informs a particular, profit-oriented design for the software is not addressed. Theoretically, Jewitt accounts for software's procedural resources in terms of the user's design and the interactive meaning of a multimodal text, but she does not consider how these resources also shape both its ideational and textual meanings.

Field studies in HCI

Although contextualised research has by no means been a dominant tradition in HCI, it has yielded some influential insights. Within HCI, this includes a range of approaches including ethnography (Cooper *et al.*, 1995, Nardi and O'Day, 1999) and ethnomethodology (Suchman, 1987). A number of HCI studies use a truncated version of ethnographic methodology to investigate what people do 'in the field' (again, for an overview, see Preece *et al.*, 2002). These 'field studies' are used to reveal how designs fare when used 'in a real world context' (Preece *et al.*, 2002:362). The usual practice in interaction design is to spend less than a week investigating a field site, because of the time constraints of software development schedules (Preece *et al.*, 2002:364) These field studies are usually motivated by market research. Consequently, they tend to focus on generating design ideas and identifying potential opportunities for future product development, rather than aiming to understand some more fundamental characteristics of the society, industry, or the people in question.

A field study might use the story of the boys' 'insult game' to develop an idea for an 'insult generator' application in a children's social networking application, and could possibly use the interaction as the basis of a simulation – or turn the data into a procedural representation of the rules governing the game. Alternatively, it might suggest ideas that could make the interface for a children's search engine more gamelike, sociable and playful, or to suggest alternative ways of addressing children's queries on sexual topics.

Ethnography

Semiotic approaches have been highly influential in ethnography, where they constitute a distinct interpretive style. Such approaches acknowledge the central role of language and signification in the construction of a way of life. Geertz, a key figure from this tradition, explains that an ethnographer's primary aim is to gain access to the shared meanings and contexts that allow meaningful dialogue with others.

Gaining physical access to a research site is thus only the first step in a slow process of entering the conceptual world of a group of people, in order to converse with them (Geertz, [1973] 1994:227).

Ethnographers in this tradition see 'culture' as complex, inter-related networks of meaning, or, in Geertz's words, 'webs of significance' that must be lived to be understood. The semiotic style of ethnographic analysis is diagnostic, and inferential, focused on finding the 'unapparent import' of the everyday (Geertz, [1973] 1994:228).

This methodology would see the story of the boys' interaction primarily as a narrative, or a 'thick description' of an event which interprets as it records an observation. This 'thick description' is later analysed for its broader social significance. The centrality of interpretation and signification is acknowledged as a strength, rather than a weakness in an anthropologist's representation of his or her findings. The narrative dimension of ethnographic writing foregrounds the role of the researcher in constructing a 'scholarly artifice' rather than pretending to faithfully reflect 'social reality' (Geertz, [1973] 1994:221).

Geertz provides several examples which suggest the inadequacy of straightforward observational and recording techniques. First he points out that a recorded image from a camera would not be able to distinguish between a wink, which carries distinctive social meanings, and an inadvertent physical response, or a 'twitch' of the eye (Geertz, [1973] 1994:215). Second he compares an ethnographer's interpretation of the rich multimodal text of everyday life to the process of making sense of an incoherent, transient manuscript, written, not in words, but in the elusive shadows of people's daily activities, or 'shaped behavior'. This lived, moving text that must be read by the ethnographer is alien, mysterious, and designed to mislead. Geertz describes the ethnographer's text as 'foreign, faded, full of ellipses, incoherencies, suspicious emendations, and tendentious commentaries' (Geertz, [1973] 1994:217). Contemporary multimodal technologies and methodologies allow a subsection of the sensory experience of everyday events to be recorded and thus made less transient. This does not, however, make their meaning any less elusive.

Ethnography has roots in colonial domination, where anthropologists were tasked with developing a coherent narrative that could explain the mysterious behaviour of people from dominated cultures ('the other'). An awareness of this history has led

anthropologists to emphasise self-reflexivity, where they consciously reflect on their own role as part of the situation being studied (Cameron, 2001:53).

My interpretation of the recordings of the boys' laughter as an 'insult game' is an attempt at ethnographic specification, where I interpret signifiers such as laughter, expressions of disgust, and body language, and try to draw out what the boys were 'up to'. A more in-depth contextual reading of the significance of the boys' game is barred to me – I have no idea whether they were good friends or best friends, for example, and what Zahid's seeming betrayal meant in the context of that relationship. I also do not really know how they made sense of the pornographic images they saw, or what discourses and experiences of sexuality they may have drawn on in reading it. This is a function of my limited knowledge of their individual and familial contexts as a classroom researcher.

A number of studies of software are situated squarely within the ethnographic tradition (e.g. Zuboff, 1988; Cooper *et al.*, 1995; Nardi and O'Day, 1999;). These studies pose key questions about the social significance of software use. To use Geertz's phrase, these studies allow researchers to ask what people are 'up to' (Geertz, [1973] 1994:221) – in this case, what they are doing as they use or design, sell and market software. As Geertz's phrase suggests, much that is significant about human social interaction goes unsaid and unspecified. Observational methods aim to develop an insider's perspective in order to be able to explain the significance of everyday behaviours and practices.

Some of these studies turn their attention to the practices and social values within the software industry and the broader society. They draw on the sociology of scientific knowledge, and show how social relations influence both the creation and use of technologies (Cooper *et al.*, 1995:12).

This kind of study would be able to provide an understanding of 'what the owners are up to', or the social contexts, values and motivations which have informed the design of the MSN search engine and the Mega Porn website.

The ethnography of communication

Approaches from the ethnography of communication provide useful concepts and methods for understanding software as mediated discourse. The ethnography of speaking developed as an anthropological method of 'investigating the rules of

speaking that are operative in particular language-using communities' (Cameron, 2001:55).

As Cameron explains, traditional techniques such as interviewing, and lab research, are social events with structures and conventions that are not always in focus for researchers.

Discourse is not just a straightforward window on research subjects' social or mental world. If social researchers treat getting their subjects to talk simply as a means for getting to know 'how things are' for those people, they are missing an important point. In effect they are using subjects' speech as a source of evidence about their culture, but forgetting that speaking is itself a part of that culture with norms and conventions of its own (Cameron, 2001:65-6).

Originating in linguistics (Hymes, 1972), this particular ethnographic approach recognises that language use and other social activities are intricately interdependent, and are important in understanding a particular way of life. Perhaps most importantly, language, which is central to all qualitative research methods, is interesting in its own right, and is not simply a transparent means of obtaining 'information' or a neutral representation of research data (Cameron, 2001:54-5). The broader cultural context provides the framework for analyzing both specific instances of communication and conventionalised ways of using language, or 'speech events'. A shift from the initial focus on spoken language to communication in general has broadened the field from an 'ethnography of speaking' to an 'ethnography of communication'. This term acknowledges that communication is not limited to spoken language, but that it includes the whole multimodal ensemble of embodied communication, print literacy practices and mediated discourse in general (Cameron, 2001:53).

As explained in the previous chapter, within Hymes' framework, the social context for speech is the 'speech situation' – such as a birthday party, wedding reception, or university lecture, which includes particular 'speech events' such as a bridegroom's speech, or a lecture. Speech events themselves are defined by 'rules of speaking', and here it is significant to address which speech acts are chosen, and in what order they are performed (Hymes 1974:53). As explained in Chapter 2, the researcher goes beyond a linguistic analysis, and documents how a speech act is given significance in a particular situation. The complexity of social relations go beyond a simple dyadic

interaction between 'speaker' and 'hearer', and so the term 'participant' is preferred, and the researcher aims to understand how participants themselves understand the significance of a particular speech event (1974:54). The researcher draws connections between the behaviour observed in the speech event and the broader social context, and explains why a particular kind of event has assumed a particular shape and character in that environment (Cameron, 2001:57).

The ethnography of communication thus provides many useful concepts for a contextualised analysis of multimodal discourse. Nonetheless, this study is not an ethnography, but is rather focused on finding the 'rules of communication' in certain genres of software, and documenting how these afford discourse in particular contexts. I used a short field study to investigate the situation in which the computer lab classes took place, while the limited participant observation available to me as a virtual ethnographer helped me to interpret the discourse of the online gaming guilds.

Acknowledging the importance of context is much simpler than being able to define it and read it. When studying sequences of multimodal discourse, I analysed the software as a procedural design for certain types of meaning, and then showed which aspects of this design became significant to software users in the particular context of study. I have tried to explain the contextual meanings for these decisions. My interest is not primarily the ethnographer's interest in *what* meanings are expressed and *why*, but the linguistic and semiotic question of *how* they are expressed in a new medium.

Social interaction often conforms to procedural genres, and this concept allows for comparison between the 'rules of communication' that apply in various conversations and circuits of media use. It also helps to document what happens when the structurally encoded procedures of software come into contact with the more flexible norms of conversational interaction. For example, the boys' play with insults can be read as an illustration of clashing sets of rules governing children's communication about sexual topics. On the one hand, the libertarian defaults of the search engine are diametrically opposed to the rules that apply in the classroom, or indeed in the legal regulation of the South African media industry as a whole. Piet breaks these rules while conforming to another set of norms of speaking that govern childhood friendships and a specific genre of playful banter between boys. The search engine, by default, assumes that its results are addressed to a grown up, and so did not apply any rules of censorship. The default search settings that were applied in the school lab also presume that users should see South African results first.

Sites of study

This study focused primarily on providing a semiotic account of software in use in two different sites, and so it is essentially a multimodal discourse analysis of classroom discourse (Chapters 4 and 5), and a virtual ethnography of communication among two guilds of online gamers (Chapters 6 to 8).¹² It is important to state at the outset, that, while both studies emphasise the ethnographic methods of observation and in-depth interview, and sought to find the contextual significance of discursive practices, neither constitute a full ethnography of communication. In the one case, the children spent very little time every week using computers. In the other, I lived on another continent to the gamers who played World of Warcraft with me. Because of these methodologies, I have a very limited knowledge of the lives of the children outside the computer lab classes that I studied. The gamers' 'real life' contexts were screened from me, and I only know what they shared with the guild about their lives, or what they chose to tell me.

The two fieldwork sites were deliberately chosen to highlight the mismatch in power and semiotic imbalances between the software producer and users of widely used commercial applications and to show the considerable differences occasioned by the social context of the software use. The micro-level of interactions with software are documented to convey a sense of the local specificity of practices, but also in order to draw out, more tentatively, some more general potential implications of the workings of semiotic power through software, and of the nature of some specific interactive genres in this medium. While this is no more, and no less than a documentation of local practices in a world of infinite variety, it speaks to the power of software to export a particular set of local practices to other contexts, and there to amplify certain local practices at the expense of others.

Both the multimodal discourse analysis and the virtual ethnography confronted the ethical issue of recording and reporting private interpersonal discourse. Informed consent was obtained from participants, and issues of anonymity were addressed, using methods that are detailed below for each site. The classroom study benefited from existing ethical codes and practices accepted by both the education department of the province and my university, while the virtual ethnography confronted me with new and complex ethical issues almost at every turn, as will be

¹² Since a virtual ethnography relies entirely on textual data, this can also be seen as a form of multimodal discourse analysis.

discussed below. Ironically, as a more ethically problematic endeavour, the online study may have benefited from this ongoing process of reflection, and may in fact have been conducted with more careful attention to ethical issues.

Multimodal discourse and children's use of educational software

In the first fieldwork site, I conducted a multimodal discourse analysis of children using commercial educational software and search engines in Mountainside Primary, a primary school in Athlone, Cape Town. (I will introduce the school in more detail in Chapters 4 and 5.) Officials in the local department of education considered the school a benchmark of the successful integration of information and communication technologies (ICTs) into teaching and learning in a township school. Children's use of computers was likely to be limited to less than an hour per week using a shared machine in a school computer lab. Their activities were structured by the particular notions of drill and practice learning and the transcriptive literacy practices which predominate in this environment.

In the first site, I spent a total of nine days observing all classes in a computer lab. I recorded twelve lessons on video during these observation sessions. During the final phase of this research, I was occasionally assisted with the lab recordings by another researcher who was conducting her own study of children's software use at the time (Pallitt, forthcoming).

During these observation sessions, I stayed in the computer lab and observed all classes that visited the lab on that day. The children's interest in the camera, teachers' engagement with me, and their comments and questions meant that I played the role of marginal participant observer in most of the sessions. I also interviewed the principal and teachers during this period.

For the classroom study, permission was obtained from the provincial department of education, and from the division responsible for ICTs in the department and from the principal and individual teachers concerned. The nature of the study was discussed at the outset with officials, project facilitators, principal and teachers, and these discussions helped to shape the nature of the observations. The primary focus of the classroom study was on the children's interaction with software, and so the research was conceptualised as an observation of multimodal discourse as represented on the computer screen. All participants were assured of anonymity in research publications.

As the focus was on naturalistic observation of everyday classroom practices and mediated discourse, the research was planned not to disrupt or change regular classroom activities, beyond the unavoidable shifts occasioned by the presence of the researcher and recording equipment in the computer lab. The research was discussed with members of the Parent Teachers' Association. Individual parents were not consulted about the study. This was in accordance with the guidelines of the provincial department of education, as the children's regular classroom activities were not adapted for the purposes of the study.

Recording software use

At the beginning of the study (the Afrikaans lesson reported in Chapter 4), the class was not accustomed to my presence nor to that of a camera. The camera in particular was somewhat disruptive as the children did not have much exposure to digital cameras, and wanted to pose and look at their pictures and recordings on the LCD. By the time of the maths lesson reported here, the other researcher had been conducting observations in the computer lab for three months, and so the camera, elicited considerably less attention.

While recording, I set the video camera to focus on the screen in a mid shot, positioned from a point just behind the children so that they were anonymous but their hand gestures, some facial expressions and their overall body language were still visible. I zoomed in to capture detail on the screen when necessary, and supplemented this with screenshots taken from the browser history, which generates an automated log of user interactions. This account is thus a necessarily partial account of classroom practice, which foregrounds the mediated interaction of individuals rather than depicting the physical space, other children, and the teacher moving around the lab. I usually reviewed the video data and my field notes immediately after the field visits, combining the notes and events seen in the video recording into short narratives describing what I had seen (such as the example at the beginning of this chapter). After this the interactions were transcribed and analysed, as detailed in the example at the end of the chapter.

As the study focused on analyzing the mediated interaction rather than the whole classroom context, only one video camera was used at a time. A small still camera, a video camera, and later a high resolution camera phone were used for recordings. The second researcher, conducting a similar study, conducted the video recording of the analysis of children using Google in their science class while I took written notes

(see Pallitt (forthcoming), for a discussion of the study). The high-end camera phone offered the best combination of flexibility, mobility, recording quality and unobtrusiveness, although it did not allow zooming during a shot. A particular advantage lay in its relatively small size, and the fact that I was able to look at the LCD screen while still being aware of most things happening in the surroundings. Its audio capabilities were adequate to capture audio for transcription, although the noisiness of the lab environment meant that the video camera with microphone worked best for capturing better quality recordings of children's speech.

My objective with the recording was to capture children's verbal comments and their mediated interaction with the screen. The position of the cursor on the computer screen often revealed what the children were attending to, and they used it to communicate their focus to one another.

This study focused on deducing interactive logic from the representations on the screen, and so I did not feel that it was necessary to intrude on everyone (and double the amount of data generated) by having more than one camera to record both the children and the teachers. Written field notes were used as an additional and very important observation tool. In most cases I found that this amount of data was more than adequate given my particular research questions.

Sampling data from video recordings

Analysis of video data is very time-consuming. The researcher's gains in richness and fidelity of information about what is happening during a short period of time also mean significant losses in the amount of time that can be in focus for a study. The scope of what can be transcribed, analysed and discussed is dramatically telescoped.

I followed Jewitt's method of sampling significant incidents from the lessons I recorded. While Jewitt looked for critical instances of learning from multimodal resources (Jewitt, 2006:37), I chose to focus on those aspects of the children's interactions which provided particular insights into the coded structures and rule-governed procedures of the software they were using, and how these relate to the conversational structures of the classroom.

I wanted to be able to show teachers examples of the kind of difficulties children experienced while interacting with standard software, and also to highlight their meaning-making practices. In Chapter 4 I highlight how the procedural restrictions

caused children much frustration but also generated excitement because of their game-like structure. The examples in Chapter 5 were chosen to illustrate how seemingly smooth interactions with well-designed and usable software such as the Google interface can nonetheless impose a very specific set of rules of interaction, which are all the more insidious for being invisible. I hope that in future teachers would use the findings of my research to design their classes in ways that help children learn about the rules that shape these kinds of interactions.

Ethical questions

As Jewitt explains, the use of video during classroom activities raises a host of ethical issues. Notably, the identities of teachers, school, and individual children are displayed and the visual images cannot be anonymised by the simple expedient of changing names in a written transcript (Jewitt, 2006:33).

In my experience, the children were more relaxed about the recording equipment than the teachers, and so teachers' lack of involvement with the interactions recorded in this study should not be taken as a reflection of their usual levels of engagement with the children. In particular the teacher in the second Google lesson that I observed was especially camera shy.

All children were asked at the start of each observation whether they agreed to be observed and whether they were comfortable that I would ask them questions occasionally, and that their activities would be recorded. I made it clear that they could refuse, but no children refused my request, quite possibly because they had been taught not to refuse a request from an adult. Nonetheless, the presence of the recording equipment was seen as a welcome form of attention, and almost certainly elicited some of the performances recorded in this study. The children seemed to appreciate being able to ask me questions if they were stuck with a particular task, or could not manage to use the software. Although I aimed not to disrupt classroom interactions and so very rarely offered suggestions without being asked, I did feel a responsibility to assist children where I could, if they turned to me, or when they tried to attract the teacher's attention and he or she was not available to help.

Teachers, parents and the principal were all very patient with my presence in the computer lab and I was grateful that many teachers found time in their already busy days to answer my questions. Although I did not want to intervene in classroom practice for the purposes of this study, I did employ the reciprocity factor (Knobel,

2003:197) of agreeing to run classroom workshops for teachers and to start a computer club for the children at the end of the study.

Rules of speaking – virtual ethnography of World of Warcraft guilds

Unlike the children in Mountainside Primary, the Northern European players of World of Warcraft spend enough time using software for it to become a distinctive social space for them. Consequently, a 'virtual' ethnography of speaking was used to investigate the activities of two player guilds on the Argent Dawn server of World of Warcraft, a massively multiplayer online role-playing game (MMORPG). In contrast to the limited ICT access of the children in the first study, these players often spend several hours per day playing the game. The two guilds which are the focus of this study have developed sophisticated methods of deploying semiotic resources to mark their identities and to create the gaming experiences they value. Both guilds function as exclusive groups which use literacy and gender to mark membership, and they have developed characteristic genres of semiotic interaction. A distinctive communicative event and interface modification used by each guild is analysed to show how the affordances of the software have been interpreted and deployed by this particular community.

Finding, joining, and belonging to a community

This study strove to follow the guiding principle of respecting participants by participating in an online research site for a longer period, and thus trying to avoid a 'smash and grab' approach to online communities (Knobel, 2003:192). It is somewhat amusing, and indeed a warning to other researchers, to look back at my blogged field notes after two months of play in July 2005, where I concluded, somewhat prematurely, that there was no significant role-playing activity in the Horde guilds of Argent Dawn. The role-playing guilds I discovered several months later now provide the data and central focus of Chapter 6. The process of selecting and joining a guild is discussed in more detail in Chapter 6.

Ethical participation

Virtual ethnography presents many new challenges, such as, for example, the ease of 'eavesdropping' on interpersonal communication, and the difficulties of maintaining anonymity in an indexed and searchable cyberspace (Knobel, 2003:189). The Association of Internet Researchers suggest the following ways in which online research may exacerbate ethical dilemmas:

- By publishing research, the researcher is more likely to put participants' privacy and confidentiality at risk.
- Given the anonymity, pseudonymity and rate of flux in online communities, the difficulties of obtaining informed consent are magnified.
- The rate of change in the online environment and research site means that there are more difficulties and fewer opportunities for learning from received wisdom than in more established and stable contexts.
- Since ethical issues have strong cultural dimensions, it is not always possible to imagine the ethical issues for a particular study from the perspective of all global participants (Association of Internet Researchers, cited in Knobel, 2003).

Knobel suggests that the formulaic adherence to ethical guidelines is less important than an active process of respecting the participants in a study. Online researchers should make a particular effort to inform themselves about the community they are studying, and should invest their time and energy in participating in that community in ways valued by the members. They should be honest and open about their status as researchers, and should maintain a consistent online identity.

As Knobel points out, online public documents can be cited without permission, and do not require protection of their author's identity. A very different ethical relationship applies to person-to-person interaction and communications on and over the Internet (Knobel, 2003:189). The media of public and private interaction are converging in ways which shift and evolve rapidly, and this compounds the dilemmas of an online researcher.

In my study, I treated discourse from password-protected communities and guild channels as interpersonal communication (As I explain in Chapter 7, these are essentially private customised channels on the Web and in a game.) I treated archivable discussions such as freely accessible web-based forums as public communication, and thus I did not ask permission to quote material from the official forums of the game's publishers, Blizzard Entertainment, or from the parts of guild websites which were not password protected. I generally avoided grey areas such as the 'public' chat channels on the private game servers, or quoting extensively from chatlogs of players with whom I was not well acquainted.

I applied for permission from Blizzard to conduct the research project, and also explained my purpose to all the guilds I applied to join, and to those players who joined the guild which I established. As there was some possibility that individual players had not read my explanations, or that guild officers might have decided to admit me to their guild without fully understanding my purposes, I also used my profile on the guild websites to explain who I was and what I was doing in the research project, and also used the private messaging abilities on guild websites to gain permission from players who had stopped playing actively. I also discussed with guild members how I was quoting them, asked them to nominate a pseudonym for use in the study, which I subsequently checked to see if it was in use by some other player on the server. In the two cases where I was not able to contact the person directly (because they had stopped playing) I contacted another player who knew them out of the game context, and relayed messages to them in that way (Knobel, 2003:199).

This study has relied heavily on the generous assistance and patience of my guild mates. I showed guild members my research papers and asked them for comments on what I had written. The responses I received were all generous and helpful and helped me to fine-tune or adjust details of my analysis in several cases. (For example, they suggested that I should use a pseudonym for my own character so that the guild website could not be 'Googled'). I tried to reciprocate by being an active participant of the communities I joined (Knobel, 2003:197). I posted screenshots and some field notes as stories for guild members and others to read. In creating the gameplay videos discussed in Chapter 8, I provided the software and some assistance to one player, who wanted to learn to create his own game videos (a genre of machinima that features virtuosic Player versus Player gameplay).

Recording interactions

The recordings used to generate transcripts for the virtual ethnography are somewhat different to the video recordings of the school children, since they only record the mediated interaction of represented participants. The unmediated conversational activities of the players as embodied participants are not represented at all. I used a number of interface modifications to log transient text from the in-game chat channels and screen capture software (Fraps) to capture still images and video (machinima) that were used for the multimodal discourse analysis. Although I recorded my own video logs of interactions, they reflected my personal playstyle. For that reason I also asked some guild members to record and annotate their own video diaries for me, which are discussed in Chapter 8. In addition I used forum discussions and players' screenshots.

Analysing the rules of speaking in software

This project uses multimodal discourse analysis to investigate interactions in three different genres of proprietary software – educational software, a search engine, and a MMORPG. Approaches to analyzing images and language are relatively well established (Kress and Van Leeuwen, 1996), and so I will not discuss them in detail here. It is nonetheless necessary to pay some attention to the specifics of how I adapted discourse analytic methods in order to transcribe and analyse user interactions with software.

Not all semiotic modes in software can be ‘transcribed’ from video recordings – as the poet pointed out in Chapter 1 ‘We can’t see what is inside the computer’. Without access to source code, the interactive logic of the software, and the ‘norms of interaction’ and ‘norms of interpretation (Hymes, 1974:60-1) with which it has been encoded can only be inferred or deduced from what is made visible or audible. In the case of much commercial software, the texts that specify the internal logic of software systems are entirely inaccessible, hidden behind the legal and coded walls of proprietary source code. The would-be analyst must thus observe the behaviour of software carefully, watch a range of users trying to make sense of it, and test it under a range of different circumstances.

Table 1 shows a transcribed sequence which illustrates my analytical approach to transcribing software as discourse. The study aimed to examine and represent the children’s meaning-making processes as they interact with the software, and to look at the discursive structure of their meaning-making activities. Consequently patterns of language use, pronunciation, grammar and syntax were not analysed. Video recordings are transcribed without attempting to capture pronunciation, since the focus of the analysis is on representing the interaction with the software. Question marks and exclamation marks are added to indicate question intonation and emphasis.

To represent the unfolding of the interaction in time, the conventions of transcribing human conversation are used and adapted to represent the pseudo-dialogue of the software-mediated user circuit. This is an attempt to draw attention to the ‘rules of speaking’ in simulated dialogue structures by representing software messages as turns in a dialogue. I separate the conversational transcript from mediated interactions (with the browser, in this case).

Children's conversation	Mediated circuits	Communicative act
<i>[Three boys, Zahid, Piet, and Tyrone are standing together, huddled around the screen.]</i>	Internet Explorer:[displays WCED home page.] Zahid: [types 'Piet' into browser address bar and presses the Enter key.]	Zahid demands links to websites that match his friend's name, possibly to embarrass or insult his friend.
	MSN:[results appear, they are all South African. 29818998 matches are compared , ten are shown and the top result is judged to be: Piet Darrel ¹³ : Official Entry Portal Zahid clicks on top match: Piet Darrel: Official Entry Portal]	MSN offers a set of South African results as equivalent to 'Piet' Zahid accepts MSN's default (first) offer, thus equating pop star Piet Darrel with his friend Piet.
<i>Zahid: [smiles] Tyrone:[laughs at Piet]</i>	Piet Darrel's website:[displays, entitled Official Entry Portal The page includes a picture of Piet Darren with the tagline 'Wild boy – wilder than the game reserve' in Afrikaans and a black and white crotch shot of a girl in designer underwear, with a diamond ring in her navel.]	Piet Darrel's website offers the 'wild boy' identity and the image of the semi-naked girl. Tyrone laughs, although the site is not overtly funny. He is perhaps applauding Zahid's successful use of MSN to generate an 'insult' for Piet.
<i>Piet: [pulls a face]</i>	Piet: [takes over and closes the browser window.]	Piet rejects the site's offer and denies Zahid's insult
<i>Zahid: 'Haaaa'</i>		Zahid denies that Piet's rejection of the site's offer is genuine
<i>Zahid [turns to researcher, still grinning] Zahid: 'He lie Miss. He got porn'</i>		Zahid offers information to me about Piet's possession of pornography. Zahid accuses Piet of dissimulating (perhaps for my benefit), thus suggesting that Piet rejected the image of the naked girl rather than another aspect of the page.
	Internet Explorer:[displays WCED home page.] Piet: [opens the browser window again, types 'porn' in the address bar, and then presses Enter.]	Piet demands links to porn sites.
	MSN: [results appear, they are all South African. 449431679 matches are compared , ten are shown, and the top result is judged to be: Porn – A South African Mega Porn Site Warning: This is an adult site. You need to be over 18 to enter] Piet:[clicks on the top result.]	MSN offers a set of South African results as equivalents to 'porn' The website demands that its users should be over 18 years old. Piet ignores the site's warning and clicks on the top link, thus accepting MSN's default offer
<i>Tyrone: [looks at the screen, Zahid: [looks at researcher, biting his lip.] Piet: [turns his head back and smiles]</i>	A South African Mega Hardcore Porn Site: [displays a collection of relatively explicit pictures of naked blonde women on its home page and a warning: This is an adult site and you need to be 18 years old to enter.]	Piet defies the site's age limit Piet breaks school rules. Zahid looks for information about the researcher's reaction. Piet shows satisfaction, applauding his own action.

Table 1: Transcription of a sequence of software-mediated interaction

¹³ The pop star's name and the original Afrikaans wording are not provided to protect the child 'Piet's' identity.

Unless visual representations are highly dynamic (such as gestures or an animated Player versus Player combat sequence) they are analysed as separate still images, and the analysis is informed by the methodology and theory of social semiotics (Kress and Van Leeuwen, 1996). Gestures and other actions are transcribed as stage directions in square brackets, paying particular attention to gestures in which the children drew attention to something on the screen. Like other actions, these are presented as stage directions in square brackets. User conversations are presented in italics. In this case, the children are talking to one another, but in other transcripts they are also 'thinking aloud to themselves' or speaking to the researcher. The mediated effects and input from the user circuits are included in the transcript in roman type.

The contextual meaning of the discourse is clarified by coding the transcript with interpretations of participants' actions. Within a sequence, I focus on coding identifiable communicative acts, and allow for the fact that one turn or gesture could represent more than one action. In coding the sequence, I would ask what each participant was doing at any point, what selections they were making, and what roles they were signaling, noting the cohesion between turns, and how one action modified or clarified contributions from other participants (Pomerantz and Fehr, 1997:72).

In the example above, the search engine's automated cohesion creates an association between Piet's name and the band website. Tyrone and Zahid confirm this association with their amused reaction, while Piet rejects it. Piet rejects the connection with the pop star, or the visual offer from the scantily clad woman by closing the browser. Zahid offered me information about his friend having some pornography of his own, and this suggests that he interpreted his friend's wordless gestural rejection as the equivalent of a lie, or a false disavowal of the image of the girl. Having been 'outed' by his friend, Piet changed his strategy. Rather than denying his friend's accusation, he now seemed to want to silence Zahid with a demonstration of his own 'grown up' masculine authority.

The multimodal discourse analysis for this study focuses on how software is used as a procedural signifying resource. Descriptions of procedural logic are integrated into the transcripts along with analytical annotations, and they are typed in bold, for example

'MSN:[results appear: **they are all South African**]'.

Just as I paid attention to how participants used particular words, phrases and gestures, I also noted how specific procedural features of the software were used (or not used) within a specific social interaction, what decision-making or sequencing algorithms were being used, how the decision-making was represented, and whether or not the participants in an interaction recognised various types of automated contributions to the discourse as 'intelligible and sensible' contributions (Pomerantz and Fehr, 1997:65). What is happening here? The transcript confirms that the search engine's automated cohesion between query and results is used as a resource for a particular kind of playful but edgy meaning-making between the boys, with its randomness functioning as a kind of dice-throw.

The search engine's decision making is also worthy of investigation. It has been programmed to make certain 'decisions' about what kinds of sites are offered first in its pages of results. As will be explained in Chapter 5, these constitute its 'default' matches, or 'answers' to a particular query. MSN's default rankings foreground South African sites in both searches. These editorial judgements become more significant when the search engine is used to mediate the school curriculum.

Conclusion

Multimodal discourse analysis can be used to analyse the relations between software users and the software owners whose proprietary code controls the channel of communication. Software is seen as mediated discourse which helps to constitute a complex and networked cultural circuit. The method of transcription of a mediated conversational exchange demonstrated in this chapter testifies to the power of software owners to use their control of coded channels of communication to set public agendas and affect individual identities, while it also acknowledges the way in which software users actively use them as signifying resources, and remake the messages they receive.

This study documents the way in which commercial media producer-consumer relationships are adjusted in the process of media convergence, becoming user-owner relationships. In software, the channel is used to convey messages from one participant to another, but it is also often given editorial and decision-making responsibilities of adjudication and arbitration. My analysis focuses on software, not as an object or static text, but as an evolving discourse between designers and (sometimes several simultaneous) users. Here the ethnography of communication forms the basis for the methodology, since it allows a representation of communicative situations as sequences of communicative acts and events, and

introduces the concept of 'rules of speaking', which is a powerful way of understanding how software contributes to discourse. Questions that arise for the researcher include the following:

- Who is participating in the discourse?
- What procedural representations and 'rules of speaking' are applied?
- Whose meanings prevail in this particular context?
- Who profits from the interaction?

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Chapter 4: Cheating literacy: The limitations of simulated classroom discourse in educational software for children

In well-resourced societies, the literacies of the 'new communication order' have become essential to communication (Kress and Van Leeuwen, 1996, Street, 1999, Snyder, 2001). Consequently, literacy teachers have adapted their curricula to include networked communication such as chat and online discussion (see for example, Goodfellow, 2004, and discussions in Snyder, 1997, and Snyder and Beavis, 2004), multimodality (Jewitt, 2006), digital media and games (Buckingham, 2003, Beavis, 2004), and experiments with emerging genres such as blogs, wikis, and podcasting (Richardson, 2006). For the majority of the world, however, these 'new literacies' are exotic practices, sustained by resources and leisure which are simply not available to most people. In South Africa, Internet access is still confined to a small minority, while burgeoning levels of print literacy and growing demand for text messaging and mobile telephony would probably constitute the 'new literacies' of the majority.

Until very recently, a large majority of South African children had no access to computers at school. Since the country's first democratic elections in 1994, schools have been under pressure to provide more equitable access to computers and other ICTs. The Western Cape Province (where fieldwork for this study took place) has embarked on a process of rapid deployment of computers to all state schools (Dugmore, 2004). Literacy and numeracy development have been targeted as priority areas for these new computer facilities in Western Cape primary schools. Software provided with the labs promises many hours of self-contained drill and practice lessons in literacy and maths. This chapter shows that the literacy lessons

emphasise grammatical 'correctness' rather than meaning-making, and the numeracy software misses many opportunities to support multimodal learning. The limited semiotic capabilities of computers seem to be reinforcing prevailing notions of teaching in township schools in the Western Cape, where literacy teaching is most often a drill and practice activity, and where few teachers adopt an approach that encourages learners' active engagement in meaning-making (Prinsloo, 2005:7).

As explained in Chapter 3, a series of interviews and classroom observations were conducted with the aim of developing a social semiotic framework for children's use of software. Interviews and observations provide the context for a multimodal discourse analysis of two examples of lessons at Mountainside Primary, a township school near Athlone in the Western Cape. The first lesson was a series of maths exercises focusing on the representation of time. In the second lesson, children used educational software during an Afrikaans literacy lesson.

The following questions guided the research:

1. How do children make meaning from the software interfaces, and what interests guide their use of educational software?
2. How does educational software encode and simulate classroom discourse patterns?

Educational software as procedural genre

The drill and practice exercises of the first generation of educational software can be seen as a procedural genre which simulates the interaction patterns of classroom discourse through rule-governed sequencing of images, text, audio and sometimes video and animation. Children using such software interpret and negotiate the simulated discourse exchanges as they work through the lessons.

As discussed in Chapter 2, software 'calls' coded resources, thus relying on the prior semiotic work of other designers and programmers. This gives rise to genres of interaction which both enable and constrain representational possibilities – both for the programmer and for the user.

The constraints and possibilities for interaction spelled out in a program's source code are hidden representational resources, which govern the user's production of a mediated experience. These resources must be explored and understood by the user

in order for them to use the software. Acting within the limits set by the code, users redesign the software, usually from components provided in the software. Such components display great variety – they can be the millions of colours and individual pixels in an image editing program such as Adobe Photoshop, or the more limited options and strictly controlled sequencing of multiple-choice questions in educational software.

From this perspective, then, the characteristic interactions encoded by educational software can be understood as a semiotic mode which marshals interactive resources for the automation of traditional educational and assessment practices. 'First generation educational software often simulates classroom discourse through a dialogue-like pattern of interaction. Such educational software creates a representation of the learner and her learning by evaluating answers and summarizing them in a score or grade. In the terms discussed in Chapter 2, the score is the only mediated artefact created by the software, and it becomes a representation of the child and her learning. It is accorded a particularly high modality or truth value by teachers, learners, and software designers alike.

Political economy of educational software

The educational software discussed in this paper is built around a model of learning which is not dissimilar from local educational practices and discourses in township schools in the Western Cape. It is also a product of the United Kingdom's National Curriculum, which has been adapted and 'localised' for three South African languages. Buckingham and Scanlon's (2005) analysis of the political economy of educational software in the UK media industry helps to contextualise the origins of such software. They discuss the broader field of educational publishing as a media industry in the U.K., and show how the trends within educational publishing have affected the business of developing educational software.

They point out that, like other media industries, educational publishing is characterised by heavily concentrated patterns of ownership and a highly competitive globalised market. In the UK industry, educational publishing is primarily geared towards the requirements of national educational curricula. These trends are intensified in the production of educational software, since the retail market is smaller and software development is an expensive business. As Buckingham and Scanlon (2005) observe, the market segment for educational software in the U.K. is now simply labeled 'National Curriculum'.

A popular marketing strategy presents sets of exercises that test 'basic skills', (as defined by the 'back to basics' movement and national standardised tests): 'The market seems heavily dominated by the imperatives of national testing' (Buckingham and Scanlon, 2005:42). This approach lends itself to the development of generic sets of exercises and activities. The trend towards such decontextualised activities is intensified because, from the perspective of the software developers, profitable educational software titles need to be generic enough to be easily exported to other contexts.

'Localization' is a software development practice which allows a piece of software to be adapted so that it can be more broadly marketed. Although the basic coded structures and functionality remain the same, language and other local details are switched to suit a new target market. The process of localization can be preceded by 'internationalization' (where developers attempt to remove culture-specific elements of a package). 'Globalisation' is another strategy, which attempts to cater for a global audience while remaining unmarked by its local origins.

By bundling a set of educational materials and installing them in all schools along with computer labs, the Western Cape Education Department effectively created a viable market for educational software producers. In the terms introduced in the previous chapter, these producers become the owners of the channels which will mediate learning activities for children and teachers.

This chapter discusses two such packages in use at Mountainside Primary. The first software package was produced in the UK by educational publisher Sherston, where it was originally developed to meet the requirements of the UK National Curriculum. The software was then 'localised' under license to the UK company, by a South African firm, which translated the English content into Afrikaans, Xhosa, and Zulu, and mapped the word- and sentence-based activities onto their equivalents in the local primary school curriculum. The second package, a series of maths exercises, is a local production, originally produced in South Africa in 1984. This package bears all the marks of a low-cost 'port' to the Windows operating system from its predecessor, MS DOS.

Classroom talk and software

Researchers who have studied children talking as they work at computers have shown that the use of software generates interesting new variants of classroom discourse. Classroom discourse, like the institutional discourse of interviews and law courts, is characterised by a distinct imbalance in power – in this case an imbalance between the teacher and the class. Sinclair and Coulthard (1975) proposed a model for classroom talk which described exchanges between teachers and pupils according to the following stages:

1. Initiation: The teacher introduces a topic to the class.
2. Response: A pupil, or more than one pupil from the class, responds to the teacher's initiation.
3. Feedback (or follow-up): The teacher responds to and usually evaluates the pupil's response.

Such an exchange, also referred to as 'triadic discourse' (Lemke, 1990; Wells, 1999) or 'recitation' (Alexander, 2005), would be considered strange or unacceptably rude between two adults. Still, it is dominant in most classrooms and is the pattern encoded in most educational software.

The characteristic Initiation-Response-Follow-up (IRF) pattern is encoded in the form of multiple-choice questions and computer-based exercises:

Discourse accompanying highly structured programs conforms well to the IRF (Initiation, Response, Follow-up) structure identified by Sinclair and Coulthard in teacher-centred classrooms, with the computer often taking the initiating role. (Fisher, 1997:81)

The 'closed' questioning style in extreme versions of triadic discourse can work to shut down all dialogic interchange (Wells, 1999), and this is particularly stifling if the teacher is not open to unexpected answers, and does not encourage children to provide justification and more information, but rather asks a question and then waits for the pupils to 'read his or her mind'. The coded structures of educational software provide an extreme version of this pattern of discourse.

Fisher's model (whereby the computer plays an initiating role and learners choose how to respond) does not really account adequately for all the discursive effects of

the IRF pattern in software. Educational software embodies a closed approach to questioning because, if the software is to provide feedback, permissible responses to the initiation move must be predicted and classified in advance. This is a function of the self-linked interactive patterns characteristic of software as is described in Chapter 2. In other words, the computer takes the initiating role and also offers the children a set of permissible responses from which they must select. These responses are then evaluated in the feedback. Such software is thus a simulation of triadic discourse. Where this simulation breaks down (as it often does) the results of careless automation create a text where meaning is a problem – cohesive ties do not help the user construct coherence. Similar phenomena are found elsewhere in language, such as in the speech of very young children, or in bad translations, and have been described as 'non-text' by Halliday and Hasan (1979: 23-24).

Automated cohesion in software

Cameron cites a famous example by Sacks (1972) to describe how language users interpret sequences of utterances as a meaningful whole:

The baby cried.

The mommy picked it up.

To understand this as a sequence of talk, the listener needs to comprehend the cohesive tie which the speaker used to indicate that the two sentences are connected. The word 'it' refers back to the baby in the previous sentence. Beyond this tie, the listener probably also needs to have quite a bit of contextual knowledge of a world in which mommies take care of babies. As Cameron (2001:11-12) argues, 'we make sense of discourse partly by making guesses based on knowledge about the world'. In all verbal exchanges, speakers create cohesive ties which refer to the previous discourse and to its context: 'where the interpretation of any item in the discourse requires making reference to some other item in the discourse, there is cohesion' (Halliday and Hasan, 1976:11).

As explained in Chapter 2, similar processes apply to cohesion in software. The task of designing an educational software exercise often involves designing a framework to be filled by a package of variable media. Cohesion is planned both within individual screens, between sequential screens, and within the exchanges of the planned human-computer interaction. Since the design must cater for variable elements, the cohesion needs to try to encompass as many of the user's projected responses as possible. Cohesive relations always have their origin in specific cultures of use, and,

despite practices of 'localization,' these are exported to other contexts as the functionality of the software. By its variable nature, software tries to cater for a wide range of future communicative contexts, which may be predicted to some extent, but are essentially unknown. Users often battle to make coherent connections between the operations of the software text and their own communicative contexts and their unpredicted actions often leads to the creation of meaningless 'non-text'.

Methodology and research site

The research was conducted in a township near Athlone on the Cape Flats. Most of the children in the classes that I observed lived in the lower middle and working class housing in the area around the school. The lessons reported here were an hour long maths lesson and one half hour session dedicated to an Afrikaans literacy class. Both classes were held in the school's computer lab. In the literacy class, all forty children in the class attended the lesson and most had to share computers. In the maths class many children were able to work individually, since about half the children in the class had been 'punished' for previous transgressions by not being allowed to attend the computer class. All the children spoke English as a first language, but they were all bilingual with very different levels of fluency in Afrikaans. The children were all in Grade 6 and 7 (eleven to twelve years old).

Literacy lessons in the Mountainside Primary computer lab were observed while children used drill and practice software. This chapter presents a detailed multimodal discourse analysis of selected interactions with the software during two of these lessons. As described in Chapter 3, children's interactions were recorded on video as they worked individually and in pairs.

In the transcripts selected for analysis, the children and the teacher are referred to by pseudonyms – Mr Jacobs was the teacher in the Afrikaans lesson. Detailed transcriptions and analysis is provided of recordings of Francie and Stevie as they experienced communicative breakdowns while using the software, while another account describes how Brenda demonstrated her use of 'cheat' strategies to me.

Transcribing children' interactions with software

Although previous studies have found that the computer takes an initiating role in the exchanges of children working at computers, researchers such as Fisher (1997) and Wegerif and Scrimshaw (1997) do not always include software output responses in their transcripts, choosing rather to paraphrase the computer output along with the children' actions and gestures. The transcriptions in this chapter are transcribed (and

represented) using conventions described in Chapter 3. Gestures play a particularly significant role in the first transcript and so they are included in the representation (Table 1). As one of the software packages is in Afrikaans, an English translation is provided.¹⁴ In addition to the transcription, still photographs and screenshots are analysed separately,

The transcription is coded according to the speech acts in the IRF structure to convey the 'rules of speaking' simulated by the software. A separate coding scheme was developed to analyse students' troubleshooting strategies as they attempted to solve cohesive problems that arose as they interacted with the software.

Multimodal transduction

Jewitt provides a fascinating discussion of two school children learning as they use a games authoring package. Her multimodal transcription of their activities shows that they use a 'gestural overlay' which is crucial to their experience of collaborative learning (Jewitt, 2006:87) by pointing at the screen in order to plan the movements of a ricocheting bullet in their game. Subsequently, the 'inner signs' that they generate are translated through 'transduction' into their various attempts at procedural designs. As Kress (2003:36) explains it, 'transduction' is the 'shift of 'semiotic material' ... across modes.'¹⁵

The command-line channel

In Mountainside Primary Grade 7 children had similar problems with the transduction of their inner signs into the 'rules of speaking' that govern input to software's user circuits. The software they used was a set of computer-based exercises from a maths package used in Mountainside Primary.

While computer hardware affords a wide range of options for multimodal display and input, software channels determine a system's actual capabilities. Discussions of

¹⁴ The original Afrikaans text is reproduced in Walton (2007).

¹⁵ In Jewitt's example, the children must program a 'bullet' to 'bounce' off obstacles in the game's object oriented physics simulation. Jewitt focuses on the children's learning process as they engage with concepts such as angle and movement. Reading her description symptomatically, it appears that the object oriented physics simulation (where bullet objects 'have' a bounce method) did not match the children's notions of how people bounce objects (and both of these are different to the real laws of physics that govern a bullet ricocheting off a suitably strong surface).

multimodality seldom consider the limitations of most desktop systems in relation to multimodal input. These are exacerbated in this example, because the maths package was originally designed in 1984 for command-line interaction in the Microsoft DOS operating system. This means that the software was designed to rely primarily on keyboard input. The Microsoft Windows operating system allows a simulation of 'direct manipulation' with its graphical user interface. Subsequently, the package was redesigned and converted for a graphical user interface. The software is expensive,¹⁶ but the exercise I observed displays very few visible changes to the command-line style of interaction other than the graphical user interface and menus used primarily for navigation.

Transduction and multimodal representations of time

The exercise under discussion is intended to teach children skills associated with the multimodal representation of time. Ironically, given this aim, the software's command-line structure expects children to use a limited and confusing monomodal language. The channel of the maths package determines the 'rules of speaking' by restricting the available input modes in the software channel to the numeric and six function keys on the keyboard.

During the class under discussion, the children completed a set of exercises on the topic 'time'. The exercises all displayed a digital or analog clock and the instruction 'Convert time into words'. The aim of the exercise was to test whether children knew how to convert between visual, numerical and verbal representations of time, or, in semiotic terms, whether they had mastered 'transduction' between different modal representations of time.

Francie was observed for the duration of the lesson, an extract from which is recorded in Transcript A. At the start of the lesson, she was not entirely confident about converting time from an analogue clock into language, and she used a technique that she had been taught in her maths class. She did not appear very confident, seeming somewhat tentative in her interactions with the software, and gasping in dismay when she received negative feedback for an 'incorrect' answer. Once she had worked out her answer, the difficulties of interacting with the software only exacerbated her confusion. This apparent confusion and insecurity was

¹⁶ Schools who wish to purchase the software pay about R800 per machine on installation, and then pay an annual R899 licence fee.

intensified by the additional difficulties she encountered when 'translating' her answers into a form acceptable to the software.

The method of input for the exercises required Francie to master an additional level of transduction: she had to phrase her answer as a sequence of keystrokes before the software would be able to treat it as input. In the 'Convert time into words' example, the software forces children to provide answers by formulating sentences by using one of the following keystrokes on the function keys:

F5 – quarter

F6 – to

F7 – past

F8 – half past

F9 – am

F10 – pm

In other words, the answer 'quarter past 1pm' would be input as the following sequence of keystrokes:

F5, F7, 1, F10.

The clock exercise is represented as a procedural genre (Table 1), using the technique explained in Chapter 2.

The poor design of the software is apparent from this procedural representation. Even the instructions have not been adequately proof-read. The package is poorly designed, and, as the complex procedures in Table 1 indicate, its confusing interface is the focus of the attention, rather than the topic of the exercise. A more fundamental problem is revealed in the list of 'may not' proscriptions, which represent the fact that the package proscribes most forms of input, thus forcing the complex transduction activities. These proscriptions only became apparent from studying Francie struggling to find a suitable semiotic form in which to convey her intended answer (or illocution) to the program. Transcription A is an extract from a transcription of Francie struggling with this process of transduction.

Maths software

In order to get a mark for the Reading Clocks exercise, you:

Must work out that you need to enter the following sequence of keystrokes, in that order - 'F5, F7, 1 F10, Enter';

Must not imitate the example given in the instructions;

Must work out that you need to enter the function key for 'AM' or 'PM'; rather than 'o'clock' as indicated in the example.

Along the way, you:

May read the key which explains the use of the function keys;

May use the delete key to cancel any of your input;

May enter the wrong answer and get negative feedback;

May not use the mouse to interact with the clock diagram;

May not use natural language to represent your answer;

May not use keystrokes from the alphabetic section of the keyboard;

May not use gestures to work out your answer;

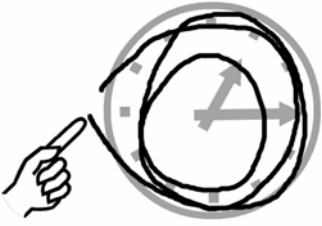
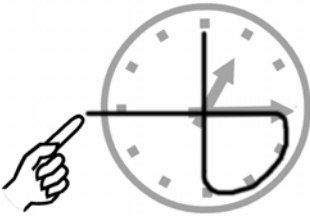

May not type the word 'o'clock' (although this is indicated in the instructions).

Mediated artefact:

If you meet these conditions, your mark will be recorded and your score will be incremented by one.

Table 1: The clock exercise represented as a procedural genre

Transduction is a complex task, which involves the simultaneous interpretation and production of at least two different representational modes. The diagrams included in Transcription A show how Francie also used a 'gestural overlay' to work out the answer. The children had been taught how to subdivide the face of a clock into quarters and to use this to interpret the position of the minute hand, and to represent its position in words. At the start of Transcription A, Francie is 'reading the time' or transducing the position of the minute hand into words. Her gestures suggest that she is drawing imaginary circles in a 'gestural overlay' over the clock, and slicing them into halves and then quarters in order to work out the time. She chooses a function key, but its mediated action ('half past') does not match her illocution. This seems to make her doubt her own understanding, and she checks her answer against another gestural overlay, which reminds her where 'half past' would be on the clockface. She confirms her initial illocutionary act by putting it into words 'quarter past'.

Illocutionary acts	Gestures scaffolding the illocutionary act	Mediated effect
<p><i>Francie: [traces circles with her finger in the air.]</i></p> <p><i>Francie: 'Fifteen'</i></p> <p><i>Francie: [points at the screen, and then taps her head.]</i></p> <p>She is 'reading the time' or transducing the position of the minute hand into words.</p>		<p>Software: [On the screen, an analog clock displays the time as fifteen minutes past one. The instruction on screen reads 'Convert time into words']</p>
<p><i>Francie: [draws a large downward stroke in the air, and then draws a line to the side.]</i> She may be slicing the circle she just drew or dividing the face of the clock into quarters in order to work out the time.</p>		
<p><i>She counts on her fingers</i></p> <p><i>Francie: 'Uh, uh, not half past'....</i></p> <p>The mediated action ('half past') does not match her illocution.</p> <p><i>Francie:[draws another downward stroke in the air, perhaps halving the clock again.]</i> She checks her answer with another transduction, and reminds herself where 'half past' would be on the clockface.</p>		<p>Francie:[presses F8]</p> <p>Software: ['Half past' appears on the screen.]</p>
<p><i>Francie:'Quarter past'.</i></p> <p>She confirms her initial illocutionary act.</p>		<p>Francie:[presses the backspace key]</p> <p>Software: [deletes 'Half past']</p>

Transcription A: Francie converts time into keystrokes

The full transcript was coded in terms of the 'communicability evaluation' method developed by De Souza (2005). Communicability evaluation reads the video recording for traces of the user's semiotic processes as she tries to use the software.

Communication is considered successful where the user's 'illocution' (or interactive intention) gives rise to an intended 'perlocution' (or effect of interaction).

In the terminology used in this study, this would mean that the user's illocution matches the mediated action of the system. Breakdowns in this communication include complete, partial and temporary failures of communication. The number of communicative breakdowns in the course of one exercise suggests the unnecessary complexity for Francie of formulating her (correct) answer in keystrokes acceptable to the system.

Of the twenty-one breakdowns that were coded in the full transcript, fifteen suggested temporary failures of communication. The final breakdown was a complete failure, as Francie looked to the teacher for help. (As the teacher was busy, I assisted her at this point).

Francie's processes of semiosis and learning strategies are not only poorly supported by the software, but it repeatedly makes her doubt her own knowledge (as seen in Transcription A). Reading the full transcript (not reproduced here), or watching the video is a grueling ordeal. As she has not seen the function key for 'past', Francie looks fruitlessly for a way to enter the answer. She guesses (perhaps based on her former experiences with word-processing) that she can enter text with one of the other function keys and edit it, or that she can use free-form text entry. When these hypotheses fail, she suspects that her actual answer might be wrong. She seems to check her answer six times in total. This is probably the most negative aspect of the software – its poor design has led her to lose faith in her own abilities.

Many children, including Francie, were so confused about how to enter their answers that it almost certainly impeded their learning from the exercise. A full redesign using a graphical user interface would have led to a marked improvement in usability, as it would have required one fewer stage of transcoding. Such a redesign would have allowed the children to click on buttons labeled with words – they would input the answer above by clicking the following sequence of buttons:

'quarter' 'past' '1' 'pm'

An even better approach might have been to allow the children to use embodied interaction, where they could use their semiotic abilities in natural language and

gesture to scaffold the transduction from image to words, and from clockface to time.

The required keystrokes are an example of a 'restricted language' made up of a limited number of elements (Halliday, 1989; Burn, 2006:84). The elements function as an idiosyncratic code, useful only for this particular exercise, and requiring an additional stage of transcoding from children, as they transform their natural language phrases into a semiotic form that is accepted as legitimate input.

Francie's interactions with this package are represented in Figure 1. The diagram (using the technique described in Chapter 2) represents the sequence of actions (syntagm) which are needed for Francie to achieve her goal (incrementing her score). The paradigmatic options are the represented and unrepresented mediated actions which Francie can choose from as she interacts with the package. The new dimension of the diagram, or the additional acts outside the software channel are suggested by watching a user rather than merely analyzing an interface. Most notably, Francie signifies her illocutionary act (the answer 'quarter past 1 pm') in gesture, spoken language, and in written language selection (via the keyboard). These signifiers are all outside the software channel circuits – although the operating system can handle interaction with the graphical user interface and accept letters as input from the keyboard, this package does not recognise them.

At the end of the interaction, the mediated artefact, or Francie's score for the exercise summarises her understanding and her abilities in a numerical representation. The number hides all the complexity of the semiotic processes suggested by this short discussion. The shaky state of her knowledge, the confusion caused by poor interaction design, actual errors in the software, and my assistance are all erased from the record.

In the exercise that I observed, the heart of the package, the interactions used to evaluate children's learning, has not been updated. The flaws of the software suggest a low production budget, and minimal expenditure on the exercises themselves. Even basic proofreading and usability evaluation does not seem to have taken place – perhaps owing to the fact that its users are a 'captive audience' of children who do not make the purchasing decisions.

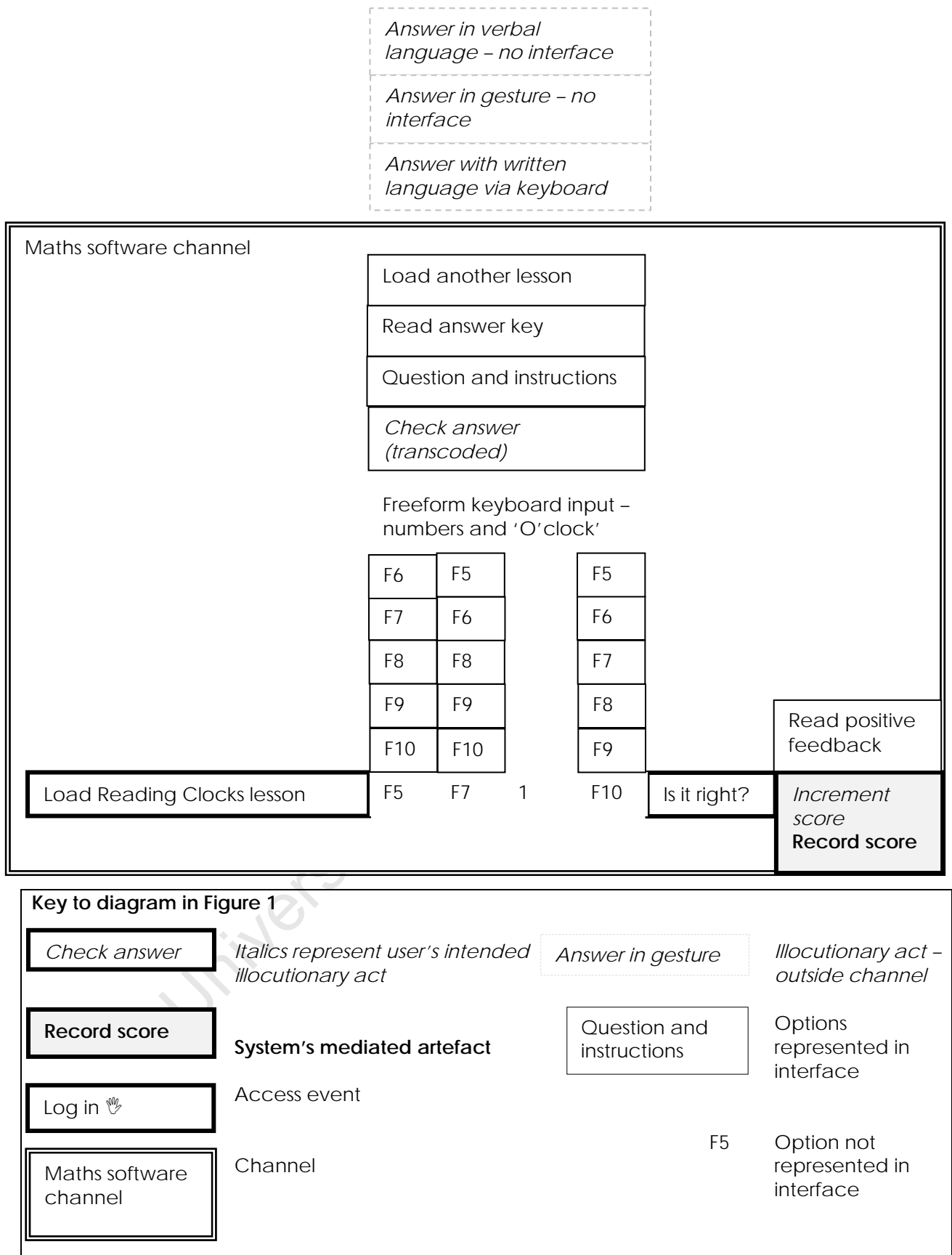


Figure 1: Communicating a correct answer to a maths educational software package

The diagram also indicates that, unlike the voting package, this kind of puzzle-like educational software does not aim to communicate or represent the illocutionary act

in the interface, For this reason, Francie's only representation of her answer (illocution) is in the text that is displayed to echo what she has entered via the Function keys.

Puzzles, as defined by Salen and Zimmerman (2004:81), are 'games with a correct answer'. Software simulates puzzles with ease, since the solution to the puzzle is stored internally, the interface does not reveal the answer, and the player's goal is to discover the solution. In this case, the puzzle genre maps neatly onto classroom 'rules of speaking' in the IRF structure.

Interpreting software and troubleshooting non-text

In another lesson, with a different class, Stevie was observed as he worked on a grammar exercise. Unlike most of the other children in his class, he worked on his own. He wore headphones so that he could listen to audio instructions and feedback as he worked on the exercises. Linda was sitting at the computer next to him where she was working through the same set of exercises with a partner.

In the sequence immediately before the extract begins, Stevie participates in the simulated discourse with the program. The program instructs him to add commas to a paragraph. He responds to the initiation move by adding what he thinks are commas, but he receives negative aural feedback, which translates as 'Oops, you haven't found everything yet' and receives a score of 0/6. At this point the simulated discourse breaks down, because the response creates a problem of coherence for Stevie, since turn 4 is 'non-text'. The program responds, 'Oops, you haven't found everything yet'. The negative feedback and low score are based on a simple count of the number of commas inserted, rather than any awareness of what Stevie has been doing.

#	Conversation	Mediated effects	Simulated discourse	Trouble-shooting acts
1	Stevie: [Turns to Researcher and hands her the earphones, pointing at the screen] 'They say I got 0 out of 6, Miss.'			Offers information, Identifies problem
2	Researcher: [Puts on the earphones and tries to find the missing commas.]			
3		Stevie: [presses the ('Is it right?') button so that Researcher can hear the program's negative feedback]	Response	
4		Software: [('Oops, you haven't found everything yet.') A pop-up displays ('You have 0 out of 6 points in this activity').]	Follow-up & Initiation	Problem – Non-text
5	Linda: [points at Stevie's screen] You used full stops not commas, man.			Debugging: offers hypothesis
6		Stevie: [presses the 'OK' button]	Response	
7	Stevie: No			Denies hypothesis
8		Stevie: [He looks closely at both screen and keyboard and then replaces all the full stops with commas. He presses the ('Is it right?') button.]	Response	Debugging: Tests Linda's hypothesis
9		Software: ('Oops, you haven't found everything yet.') [A pop-up displays ('You have 0 out of 6 points in this activity').]	Follow-up & Initiation	Problem – Non-text
10	Stevie: [Turns to Linda and touches her shoulder]			Identifies problem and demands help
11		Linda: [Takes the mouse from Stevie and clicks ('Try again') to restart the exercise]	Response	Debugging: Offers and tests hypothesis
12		Stevie: [Adds all the commas a third time, and clicks the ('Is it right?') button again]	Response	Debugging: tests hypothesis
13		Software: [A pop-up displays the score 6/6.] ('Correct. You got it right the very first time.')	Follow-up	Non-text
14	Stevie: [hands the researcher the earphones.]	Stevie: [Clicks the 'OK' button and clicks ('Is it right') button to play the feedback again so that she can hear]	Response	Displays mastery
15		Software: [A pop-up displays the score 6/6.] ('Correct. You got it right the very first time.')	Follow-up	Non-text

Table 2: Transcription B: Stevie tries to complete a punctuation exercise (program text translated from Afrikaans).

The feedback is non-text because Stevie *has* found all the places where commas should be inserted in the paragraph, but the program cannot recognise this. Consequently it refers to Stevie's actions in the previous turn in a way which breaks the cohesion of the discourse – the word 'everything' refers anaphorically to Stevie's commas in the previous response, but this does not cohere with Stevie's experience. The feedback is confusing to Stevie, because he has identified all the places in the paragraph where commas are required, but he has used the wrong key on the keyboard. His response to Linda in line 10 suggests that this mistake arose from an inadvertent 'typo' rather than from lack of familiarity with punctuation.

From turn 4 onwards, Stevie is no longer engaging with the simulated discourse on its own terms. Nonetheless, the discourse can only proceed if he accepts the verdict of the program by pressing the 'OK' button. He presses 'OK', but his subsequent comment to me indicates that he is not in agreement with the feedback and has not in fact accepted the program's implicit instruction to insert some more commas.

Instead of responding to the program's initiation move and continuing the simulated discourse by adding more commas, or using the 'tip' button to get assistance from the program, Stevie appeals to me as the nearest available adult and authority figure in the classroom. His comment in line 5 'They say I got 0 out of 6, Miss' might be a simple request for clarification, or it might be an appeal against the authority of the program. In either case, he is identifying a problem within the simulation which he needs to troubleshoot.

There are several textual cues here that Stevie steps out of the simulated conversation with the program at this point and questions its authority. First, he chooses to refer to the program as 'they'. This is an indication that he is not engaging with the simulated discourse, since the pronoun 'they' refers to an anonymous plural subject (possibly the program developers). It does not refer to the animated cartoon character who supposedly addresses the user in the software's interface. It is also significant that Stevie says 'They say I got 0 out of 6' rather than 'I didn't find all the commas', or 'I got 0 out of 6'. Stevie has not accepted the program's verdict, and he is more interested in appealing his score than in the task of finding missing commas.

When responding to Stevie's appeal, I initially took the automated feedback at face value. I assumed that Stevie had not found all the commas – in other words I accepted the program's diagnosis rather than Stevie's identification of a problem. The repeated feedback in line 8 is another example of non-text. First, the program's

'you' lacks exophoric cohesion because the listener is now a different person – the researcher rather than Stevie. Second, the expression of surprise 'Oops' is also out of place in a repeated version of the feedback.

In turn 9, Linda overhears Stevie's comments and offers a debugging suggestion (with some condescension), pointing out what I had not noticed – that Stevie had used full stops rather than commas. Linda's suggestion could be viewed as a hypothesis in the trouble-shooting sequence.

Stevie initially denied that he had used the wrong punctuation mark, then looked closely at both screen and keyboard, and realised that Linda's diagnosis was correct. He changed his answer, replacing all the full stops with commas. He tested the hypothesis but received the same feedback, which now lacked all cohesion with the display on the screen, and with the previous exchanges in the discourse, since Stevie had in fact inserted all the commas in the right places. The program did not accept his corrections until Linda helped him to restart the exercise from the beginning. (This may have been a usability problem with the software.)

Stevie inserted all the commas for a third time, and now he was awarded full marks for the exercise, since all previous variables had been reset when Linda helped him restart the exercise. He passed me the earphones so that I could also listen to the positive feedback, which translates as: 'Correct. You got it right the very first time'. Because Linda had restarted the exercise, the program had no record of Stevie's two previous attempts, and so praised him for completing it correctly first time around. Stevie's response suggests that he was now happy to step back into the simulated discourse and to accept the program's praise.

The software was unable to interpret Stevie's input as a human teacher would have (and as Linda had been able to). In this case, 'drill and practice' meant that Stevie had to 'drill and practice' a skill which he had already mastered. In total he repeated the rather unexciting comma exercise three times over. His sense of achievement at the successful process of troubleshooting the problem with the program seemed to make up for the limited cognitive challenge in the content of the exercise. His sense of achievement was palpable, and his insistence that I should also listen to the positive feedback suggests that he also enjoyed the display of his mastery over the program's little puzzle.

Playing with the rules – cheats and hacks

In another interesting power struggle with the software, Brenda called me over to show how she had successfully bypassed the simulated discourse of the content of an exercise and had still achieved full marks. (For reasons of brevity the full transcription is not provided.)

Brenda tugged my sleeve as I was walking around the classroom. When she had my attention, she pointed out that she had full marks for one exercise (46 out of 46). I congratulated her and she shook with laughter. The two girls working next to her quickly explained to me that she had found a way of ‘cheating’ and getting the ‘high score’ for that exercise. I asked Brenda to show me her trick, and she explained her method: ‘I click all of them, Miss, and then I just go there – ‘Is it right?’ – and click, and it come all right, Miss.’

Brenda had been working on the sentence structure exercise depicted below (in Figure 2). The exercise in question focused on sentence structure by instructing the learner to click on the ‘main idea’ in each sentence. Ideas are pretty hard things to click on at the best of times, and the exercise in question in fact required learners to demonstrate their knowledge of sentence structure by clicking on all the words of the main clause of each sentence.

When I asked Brenda to try the exercise without the ‘cheat’ I found that she had not identified clauses at all. Figure 2 is a photograph of her attempted answer. Two sentences are provided with English translation below. Brenda had clicked on the words highlighted in bold.

*Die meisie praat met **die** man **met** die **rooi** baard.*

*(The girl talks with **the** man **with** the **red** beard.)*

*Sy het die **boek** van **voor** tot **agter** deurgelees.*

*(She read the **book** from **beginning** to **end**.)*

At first I thought that Brenda had selected words at random, or according to some kind of pattern, since her selections did not correspond to the grammatical structures of the sentences. When I discussed the exercise with her, however, her interpretation of ‘main idea’ seemed to diverge from that embedded in the software. Although I am not sure I fully understood her explanation, she may have tried to select words

which summarised the content of the entire sentence. She was certainly not aware of sentence structure in the way required by the software.

The exercise was poorly designed, since, as Brenda discovered, it could be 'hacked' by clicking indiscriminately on all the words in the sentence. The designer had probably intended that learners should think about the meaning of the sentences, identify the 'main idea', and then carefully select the words of the main clauses (which, according to grammatical orthodoxy, express the 'main idea' of a sentence). By developing this ingenious cheat, Brenda was not interacting with the words and their meanings at all. Instead, she was reading a different text, which to her carried a far higher modality – this was the software scoring system with its economy of ticks and crosses, positive and negative feedback, and final judgement in the form of a summary grade and printout. The game Brenda had designed involved playing with the 'non-text' economy of the software, hacking it to achieve a high score and displaying her mastery to elicit the admiration and attention of her peers (and possibly myself).

Reading interface and interactions

Multimodal discourse analysis should try to account for software interfaces *as software* rather than only as an ensemble of image, text, sound, animation and other modes. If coded structures are considered, the interface of the literacy package used at Mountainside Primary (see Figure 2) testifies to the political economy and global power relations within which the software was produced.

The software consists of a series of traditional grammar exercises, presented by an animated manga-style cartoon character positioned on the left side of the screen. The interface for the Afrikaans version of the program is shown below (Figure 2). The program uses the metaphor of a 'question bank' to describe its database of exercises. This is essentially an organised collection of topics, questions, tips, correct answers, and feedback stored in three different languages, for two different types of interactions – fill in the blank or click on a word. Like other drill and practice software of this kind, teachers can select lessons suitable for their learners from a 'bank' of questions. Teachers cannot, however, adapt the basic coded structures of the exercises. The limits of customization were set by the original developers who own the source code and who had decided which approach to literacy teaching would be most profitable given their target market in the UK.

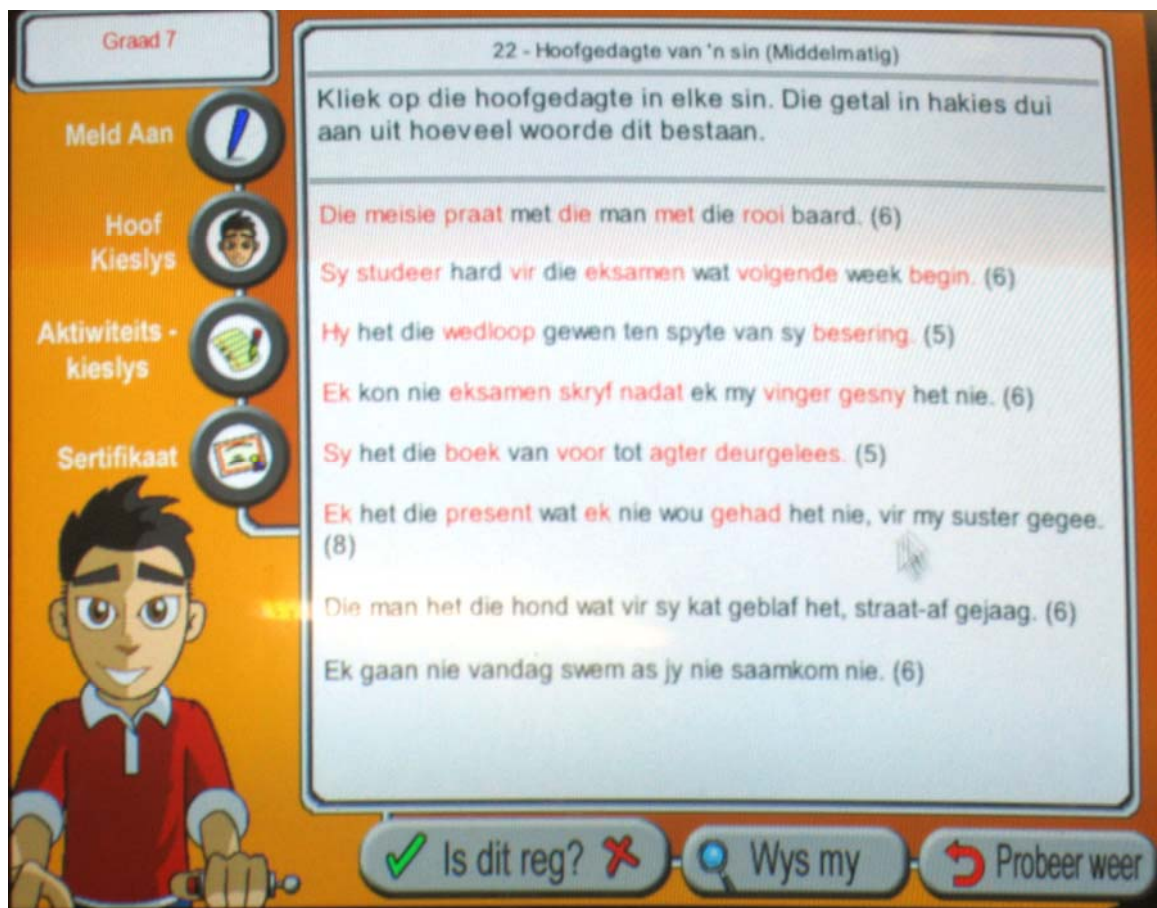


Figure 2: The question interface for the Afrikaans localization of the literacy software

The visual address of the cartoon is extended into a metaphor of a dialogue between the user and the cartoon character through the audio dialogue, which echoes text messages displayed on the screen with spoken instructions and feedback. The interface as a whole is abstract (non-representational), but it is reminiscent of the common interface convention of a television screen with control buttons to the left.

The cartoon character also addresses the user with an imperative: *'Kliek op die hoofgedagte in elke sin. Die getal in hakies dui aan uit hoeveel woorde dit bestaan.'* (Click on the main idea in each sentence. The number in brackets indicates how many words it includes.)

The next turn in the discourse between user and program is represented by the clickable areas on the screen. The user's attention is directed most strongly to the three large bevelled buttons in the lower left of the screen which are clicked when the user has completed each exercise. These large buttons, with their heavy-handed 'drop shadow' graphical treatment almost demand to be clicked. A simple

animation creates the illusion that the button is depressed when the user clicks the mouse button. These are labeled as follows:

Is it right? (*Is dit reg?*) with a green tick and red cross

Show me (*Wys my*) with a magnifying glass

Try again (*Probeer weer*) with a circular arrow icon.

In the simulated discourse of the program, the text on the buttons are the words of the user, who is offered the opportunity to choose between feedback, help, or another try. Echoing the address in the main instruction, the buttons are worded as demands, except for the feedback button. The label of this button, with its bright tick and cross, establishes the user's subordinate position in the educational hierarchy with a polite request 'Is it right? (*Is dit reg?*)'. The visual prominence and responsiveness of the buttons attracts attention, and their relative salience emphasises the notion of the correct answer. Navigational buttons are visually not as salient, but offer the opportunity to try other topics and exercises.

Other key elements of the 'click on a word' exercise are not apparent from the visual interface in Figure 2. Each word in the exercise is a hidden button. When the user clicks on a word, this adds or removes a highlight on the word. Also hidden is the list of target words which constitute the correct answer – the 'main idea' of each sentence. The coded logic of the exercise is not apparent from the visual interface. Neither is the logical error by which the programmers allowed Brenda to achieve a perfect score by clicking on all the words. Both of these can only be inferred as a result of interaction.

This interface is a visual invitation to discourse with the program. The cartoon character looks directly at the viewer, and the direct gaze echoes the imperative language of the question, creating a visual 'demand' (Kress and Van Leeuwen, 1996:122).

In the terms of classroom discourse, this screen represents the teacher's initiation of an interaction and it also conveys a visual representation of permissible discourse responses by children. The invisible buttons on the screen provide the available responses which will then be evaluated in the IRF discourse structure.

The cursor is the user's avatar on the screen – it is the visual and interactive equivalent of the second person pronoun in a running commentary on Brenda's actions. The

screen represents Brenda's mediated actions to her: 'You have moved the cursor left. You have clicked the button'. The cursor can only be used to input text or click a word or button, and so the user's possible responses to each question are limited to those which can be processed automatically.

To the left of the screen, a smiling manga-style cartoon character appears to be riding a bicycle out of the screen. His gaze addresses the user directly. This character is in fact one option selected from a paradigm of different character types (see Figure 3).

The interface which appears in Figure 2 is generated by code which displays elements on the screen to reflect a series of user choices. The paradigm itself is constructed by the developers, who choose the style of the drawings, and decided to represent a range of ethnicities and two genders.

The South African localisers first chose which local languages would be most marketable. They also selected the exercises that should be included in the Afrikaans package. The teacher, Mr Jacobs, chose a selection of exercises for each grade, (rather than the more laborious process of setting up an individual lesson for each child – which is the option advertised in the product's marketing material). Mr. Jacobs also selected a pale skinned boy as the animated character, rather than the other available characters. (See Figure 3 for a somewhat paler girl character who appears on the package's promotional materials). The exercise itself and the words highlighted in red on the screen are the choices made by Brenda after I encouraged her to complete the exercise without her 'cheat', as discussed above.

Thus Brenda's selections influence a relatively small part of the mediated experience. This is assembled by the logic of the program from a history of production decisions, made at different stages. A hierarchy of users are granted varying degrees of power in the production experience – from the UK designers who own the program's source code, to the South African localisers who provided the translations, and Brenda's teacher, who chose exercises for the class to complete and configured the installation. Compared to some of the other producers in the chain, Brenda had very little power over the representation, in accordance with 'writing-rights' and her position in the hierarchy of institutionalised classroom discourse.



Figure 3: Two of the animated characters who can be chosen for the interface of literacy bank

How does literacy software encode classroom discourse patterns?

The text instructions and the question texts for all the other questions are selected by the software from a paradigm, or a set of records in a database. The individual questions and even the interface labels and images are all generated from variables stored in a database of text strings – this design is a preferred development method for educational software. ‘Dynamic’ content such as this allows ease of translation, localization and substitution of similarly structured content. This database appears to have a data structure for the question records which resembles the structure below:

questionID
questionDifficulty
instructionText
instructionAudio
questionTitle
questionText
questionType
languageID
questionScore
questionTotal
userAnswer
correctAnswer
firstTime
firstTimeFeedback

positiveFeedback
negativeFeedback
firstTimeFeedbackAudio
positiveFeedbackAudio
negativeFeedbackAudio

Such a data structure would use the questionID field as a cohesive device (or primary key) which binds together the various fields of the record to construct the interactions for each separate question. When the user elects to answer a specific question, the question is assembled from the various fields stored for that record. The values stored in these fields determine which text is displayed for the question, but also, among other things, whether the question is a 'fill in the blanks' question or a 'clickable words' question, and whether the user's answer is considered correct or not.

This data structure is another way of representing the assumptions about knowledge implicit in the triadic classroom discourse structure. According to the data structure, every question must have one of two structures – 'fill in the blank' or 'click on a word'. Each question has a correct answer, which can be translated into numerical form. It also has a numbered level of difficulty, and is communicated in only one language. Feedback can be positive or negative, or can praise the user for completing the exercise correctly the first time around. Questions themselves are always text, although feedback and instructions can be presented in audio form as well. No questions may involve images or sounds.

The visible user interface is generated by a sequence of instructions (also known as an algorithm). These instructions are a syntagm since their meaning depends on a particular order of execution, but they make selections from elements within a finite paradigmatic structure. As an example, Figure 4 provides a representation of the procedures which are encoded in the literacy software by translating the program's logic into 'pseudocode' (a programming technique which plans code by writing a mixture of everyday language and programming code, without using a specific computer language). Coded versions of these procedures or functions would be activated when the user presses the grey buttons at the bottom of the screen. The variables allow for automated cohesion with whatever future values the user might select (for example, the number of the question) or supply (textual input in a multiple choice question).

```

Set <userAnswer> = <userInput>
If<userAnswer> is equal to <correctAnswer> for current <questionID>
    Then
        set <completed> as TRUE.
        display <questionScore> / <questionTotal>
        If <firstTime> is TRUE
            Display<firstTimeFeedback > in <languageID> for current
<questionID>.
        Otherwise
            display <positiveFeedback > in <languageID> for current <questionID>.
    Otherwise,
        display <questionScore> /<questionTotal>
        display <negativeFeedback> in <languageID> for current <questionID>.

```

Figure 4: Function logic represented in pseudocode

The larger order or coherence projected by the literacy software as a procedural genre is the classroom discourse structure of the IRF. This structure is solidified and encoded in data structures and enacted through algorithms. According to this order, learning can be measured in a numerical score, teachers are always right, and learning as well as literacy consists of being able to produce an answer which matches the answer defined as 'correct' by the teacher.

Cheating literacy

Reliance on educational software has been controversial among literacy specialists, who have labeled the 'drill and practice' genres an inferior model of teaching, which serves to develop only the 'meager literacy of subordinate classes' (Ohmann in LeBlanc 1994:31). Such scholars point out that arithmetic, grammar and punctuation exercises were often the only version of literacy teaching experienced by black and working class children in the context of the class and race-based divides in computer-based instruction in the U.S. in the early nineties:

Numerous studies ... have found that low-income and minority students tend to use computers for a remedial curriculum delivered through gamelike software. While the haves are doing word processing and programming (learning to gain power over a computer), the have-nots are doing grammar drills (learning to be programmed) (Zeni, 1994:83).

From this perspective, class divides are reinforced by different approaches to digital literacy (Zeni, 1994:30). There is little awareness of this kind of critique within the Western Cape, where the new computer labs in schools have held out the promise of 'curriculum delivery' to the majority. And indeed, the schools using literacy software can point to evidence of improvement of children's scores in standardised tests. For example, an internal evaluation found that schools where literacy software was used for a year were able to make substantial improvements to their literacy scores on standardised tests. Mountainside Primary School was exceptional in showing 100 per cent increases on Western Cape Education Department tests (Du Toit, 2005; *iWeb*, Dec/Jan 2005).

The general optimism is understandable, but the evidence in this study suggests that we should look beyond the reductive scores of standardised testing to investigate more carefully what the measured improvements in literacy scores may conceal. While improved test scores represent a significant achievement, they are not necessarily providing children with the literacy practices that will help them to learn and which are valued in society. It is also unlikely that standardised tests measure the 'new literacies' – abilities such as finding, evaluating and synthesising information, integrating image and text into a multimodal ensemble, the ability to engage in a mediated conversation over a communicational network, or the ability to program interactions (Snyder, 2001).

Although the computer-based exercises were used with dedication by both teachers and children of Mountainside Primary, the drill and practice regimen did not seem to focus children's attention on the communicative possibilities of language (In this case, Afrikaans), nor did it support the processes of multimodal transcoding, so integral to the learning of numeracy. Nor did it help them develop as active language learners. Rather, these exercises negate the understandings about language learning developed over the past century: that language is learned in context, and by interacting with conversational partners who can 'scaffold' children's development by listening to them, helping them to adjust their utterances, and responding to their ideas (Bruner, 1978; Vygotsky, 1934/1986, Halliday, 1993). In this sense, then, the educational software is a 'cheat', which claims to deliver learning and literacy while automating and short-circuiting interpersonal communication.

How do children make meaning from software interfaces?

Of further concern is the metaphor of computers 'delivering' education. In the interviews conducted for this study, education department officials, teachers, and

computer training facilitators all spoke of the need to achieve 'curriculum delivery' via computers. Educational media and technologies are provided to compensate for relatively unskilled teachers, and for large classes. This metaphor conceals complex semiotic processes, since it assumes that computers function as a straightforward conduit for information or education, which can be packaged and provided to children. The metaphor urgently needs to be replaced with a notion of software as representational mode.

This study found that computers and software are not simply 'delivering' information to children. Instead, the software is always interpreted in a specific local context. The children are engaged in an active process of sign-making, and their interests often diverge from those of their educators and the creators of the software. According to the social semiotic view, meanings do not reside on the page or the computer screen, but are generated as part of a social process. Consequently, although grammars and conventional systems of meaning do exist, '[i]nnovation is the normal condition of all human meaning-making.' (Kress et al. 2001:8). Children employ innovative processes of social meaning-making which help them make sense of decontextualised drill and practice exercises – in some cases originally designed for children on the other side of the globe.

The uninspiring 'drill and practice' software makes few concessions to the children's context, and does without the reciprocal negotiation of meaning which is fundamental to interpersonal communication. Nonetheless, this study suggests that children use the rule-governed logic of the software as a representational resource and that this is associated with certain distinct literacy practices.

The children observed in this study interpret the multimodal software text and come to grips with its procedural nature through an investigative process and delight in some creative play with the rules, or 'cheating'. They were seen to exercise troubleshooting and hypothesis-formation strategies which helped them to piece together the often incoherent software texts. Their goals in this process also related to the display of mastery and the scoring function of the software.

Conclusion

The activities analysed in the study involve children interacting with three cohesive structures– a command-line text entry exercise, a clickable text exercise and an editable text exercise. The simulated classroom discourse of the package did not visibly engage the children. In Francie's case, it seemed to actively impede her

learning. Stevie had already mastered the punctuation lesson, but was stymied when its automated cohesive relations broke down into 'non-text' as the result of an unpredicted typing error. He was reluctantly drawn into the activity of troubleshooting the software, and eventually succeeding in 'debugging' it with help from Linda. While Francie seemed to dread the verdict of the scoring system, both Stevie and Brenda were motivated by 'scoring' in the gamelike modality system of the exercises. This economy of 'scores' reinforced a test-oriented assessment system, a system of meanings which values the quantifiable outcome of the exercises over any process of developing a shared meaning through communication. The software was used to display mastery before me, the visiting researcher, and I no doubt provided an appreciative audience. In particular, Brenda had no prior understanding of the concepts relating to sentence structure, and so she was not engaged by the content of the exercise. Instead, she took great pleasure in 'hacking' the software to achieve a perfect score for the exercise despite her lack of comprehension of the 'content' of the exercise. Further research could evaluate what aspects of literacy are being measured by standardised tests and weigh these against the opportunity costs of a drill and practice approach.

If we look more closely at how children used the software, we see semiotic interactions which are an extension of the power relations of classroom discourse and the global political economy of software production. We also see children resisting this power and developing skills in interacting with, manipulating and 'cheating' rule-governed texts. This study represents only a small snapshot of such activity, but it is nonetheless clear that long term investments in teacher training and further resourcing will be required before school literacy activities with computers can shift into a different paradigm – one where children use software to develop other semiotic powers, in addition to those needed to 'cheat' the quiz. Such a paradigm would emphasise how computers can be used to mediate communication, and would develop a procedural literacy, where users know that they have the power to write their own rules.

Both traditional and semiotic approaches to user studies in human-computer interaction might identify the 'critical incidents' or 'communicative breakdowns' where the children experienced significant problems in their use of the software. This analysis has shown, however, that these dominant concerns from software development methodologies are not necessarily the most important issues to which we could attend. To address the broader meaning of the experience to the children, and the role played in that experience by the software requires the insights that

come with another set of theories and methodologies, such as those of Jewitt (2006). Here the focus shifts to questions about the meaning and design of the software, and to the children's learning. This chapter has also argued that many of the key features of the educational software as discourse are not apparent from its user interface, and that analysis of these cohesive text-making devices can benefit from the discipline of human-computer interaction's knowledge of how software is designed and developed. It also suggests the importance of a critical perspective on the political economy an industry which profits from reinforcing such asymmetrical 'rules of speaking' in the classroom.

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Chapter 5: Setting default values: Search engines and classroom discourse

We know everything you might need.

(Ask Jeeves executive, Paul Gardi, qtd. in Batelle, 2005:15)

In the past, the index of a book was hidden in the 'back of the book'. Now, the search engine index has become the interface, allowing users to construct their own interfaces to the unknown repositories of information on the Web. Search engines are thus perhaps one of the most powerful contemporary 'technologies of representation' (Buckingham, 2007:vii). This chapter provides a multimodal discourse analysis of primary school children from Mountainside Primary using the Google search engine interface. The interface is a simulation, or rather, a dissimulation, of a smooth question-answer exchange, which offers freedom and user control of discourse. At the same time, the channel's editorial rules introduce the default values of both global and local elites. These values are at odds with the values espoused in the post-apartheid educational curriculum, which aim to 'give space to the silent voices of history and marginalised communities' (Department of Education, 2002b:6). The children's learning is influenced by a history of decisions whereby search engines are designed to extract profits from the conversations that take place via this channel.

What relationships of mediation and compulsion come into play when children in socially marginal settings make use of resources designed for consumers in the centres of global power? Within global media economies, African children feature as 'second hand consumers' of global media in that they often have very different interests and characteristics to the original target market for the goods (Nyamnjoh, 2002). Nyamnjoh argues that, in these contexts, although so many media carry the implicit message that African children's local cultures are dispensable, children nonetheless make their own selections and domesticate global media in ways which are locally significant. Like other media, software is adopted in negotiated processes of selection and is recruited to serve local interests, both those of state schooling, and

those of individual teachers and children. Digital media and software do allow the Cape Town children who participated in this study the freedom to produce and distribute as well as consume media, as implied by the discussion of the children's 'insult game' in Chapter 3. In the context of formal schooling, such as the 'Googling sessions' which are analysed in this chapter, classroom discourse and local schooled literacy practices, such as transcription, prevail and provide the frame for children's activities. These practices reflect the social relationships of schooling in this context, the availability of resources, and the desire to restrict children's access to the channel.

Reading search interfaces

Figure 1 shows three search engine interfaces. On the left is AltaVista in 1998, then at the height of its power and a leading search engine. In the centre is an early Google interface from the year of the search engine's launch in 1998, and on the right is Google's contemporary interface. Google currently handles 58% of web searches globally (Comscore, 2008).¹⁷ It also provided the interface to information for the primary school children who are the focus of this chapter.



Figure 1: AltaVista home page in 1998, and Google's home page in 1998 and 2007

AltaVista's interface is densely packed and laid out with a search box above a three-column grid, a design known as a 'portal'. The designers are aware that their home page is valuable 'real estate' and every inch is packed with links, advertisements, and commercial promotions. The sparseness of Google's centred design was unusual in 1998. The simplicity of the design, the speed at which Google

¹⁷ Of the 61 billion searches conducted worldwide, 37.1 billion were from Google; Yahoo served 8.5 billion searches globally; Chinese-language search engine Baidu.com served 3.3 billion, and Korea-based NHN served two billion searches (Comscore, 2008).

could process queries, and the improved relevance of the search results soon made the brand spread like wildfire among savvy Web users,

While Google's design has changed somewhat since 1998, it has maintained a distinctively playful character. The primary colours, loud exclamation mark¹⁸ and three dimensional slab serif typeface of the original Google design suggests a cheerful crudeness – the chunky letters standing out like plastic children's toys on the flat page. Other than the brand identity, the design is a white sheet which the user will inscribe with their query. One of the buttons is marked 'I'm feeling lucky' and takes the user directly to the first result. Like the visual gag 'Goooooooooooooogle' for navigation through the pages of results, this feature suggests a gamelike whimsiness. The button has survived over the years, possibly because it encourages the user to abandon herself to the playful 'gamble' implicit in the randomness of searching.

Google's home page design 'grew up' slightly over the ten years; primarily because of the more elegant typeface in the logo, and because it acquired a trademark and copyright sign.¹⁹ It preserved the playful colours and the invitation to gamble on the 'Feeling Lucky' button. Over the past decade, a number of links have been added to the minimalist 1998 design. They are placed on the margins of the composition and all offer different modes of searching. Only the links in the footer offer information – links to additional information about Google and its advertising program, the core of its business.

The centred composition of Google's graphical user interface differs from most contemporary Western visual designs, which tend to polarise elements to the left and right, (Kress and Van Leeuwen, 1996). By convention, this usually means that the central element in the composition is presented as 'the nucleus of the information' (Kress and Van Leeuwen, 1996:206). Google's distinctive design centres on the logo and the 'search box'. The large, relatively 'close up' logo brings the user into a closer interpersonal relationship with the brand, which simultaneously demands attention. The search box invites the user to 'inscribe' a textual representation of their interests

¹⁸ The exclamation mark also hints at a homage or challenge to the then dominant Web directory, Yahoo!.

¹⁹ Google now also provides many other interfaces to its search engine. Its search box is integrated into other sites and browser toolbars. It also offers a portal design (iGoogle) and the latest home page shifts slightly from the centred design, with a menu bar at the top.

(the query) into the search box. Thus Google's visual design enshrines a record of the user's wants, needs, desires and interests at the centre of its composition, linking this to the distinctive Google brand identity.

The visual design of the Google home page thus focuses on allowing the user to 'demand information' from Google as an 'interactive participant' (Kress and Van Leeuwen, 1996:125-6) by inscribing a short query, or question. The expected social response to a question is an answer. The interface also allows the user to express a demand for 'goods and services' with its default imperative 'Search the web'. Given this design, it is not surprising that many people use Google and other information retrieval tools as a kind of 'one stop' question-answer interaction (Markey, 2007a).²⁰ Users tend to choose the most relevant result that they can spot among the first two or three matches to a query (Joachims *et al.*, 2005), which has led Nielsen (2005a) to refer to these positions (without a trace of irony) as the 'default values' for a search query.

²⁰ Studies of user queries as reflected by search engine logs (which include data from both the US and Europe) have found that users formulate simple queries with most users combining no more than two terms in a query, and using two queries per search session. The most common cause of failure is the user's initial choice of search terms (Markey, 2007b). Very few users search using advanced query syntax such as Boolean operators (Jansen and Pooch, 2000; Jansen and Spink, 2005), and hardly any ever look beyond the first page of search results (unless they are searching for topics to do with sex, in which they can demonstrate remarkable persistence (Spink, *et al.* 2001; Ozmutlu, *et al.* 2004; Jansen and Spink, 2005; Markey, 2007a).

Web searching sessions, as reflected in search logs, display a huge amount of variability, but a large number of web searching sessions are extremely short, with 52% of users ending the search in under 15 minutes. Just over a quarter are done in five minutes, and about 14% had assessed and left the page within 30 seconds (Jansen and Spink, 2005: 368, 373). In a large study of European users, 66% looked at fewer than five web pages in a typical search session, while almost 30% only viewed a single web page per session (Jansen and Spink, 2005: 373). There is little awareness of literacy as a variable in user studies, although proprietary research for Pfizer suggests that lower literacy users don't scan web pages, which causes them particular difficulties when using search engines (Nielsen, 2005b).

The user's query is again foregrounded on the search engine results page (SERPs). Here the engine inscribes the keywords in bold face on the titles and text snippets of the list of links on the results. In 1998, the speed at which the engine was able to construct this page was a key element of Google's success. Users experienced an application which responded instantly to their commands, rather than the long waits, sluggish responses, and spam-cluttered results that characterised other search engines at the time.

The results page offers a paradigmatic choice between alternatives, a similar interactive visual design to the list of candidates on the voting ballot in Chapter 2. As the designers of voting ballots recognise, top items on this list are accorded a special significance. The top-down arrangement of the search results 'foregrounds' the first few items, just as the heading of a page, or the first (topic) sentence of a paragraph is accorded special importance. Although computer screens have a landscape orientation (like televisions), many websites adjust this, and use a top-down organisation, which makes use of the ability to 'scroll' down a long, written document. Web designers speak of the area of the design which is hidden and not visible in the browser window as 'below the fold' (using the metaphor of a newspaper which foregrounds the most newsworthy stories 'above the fold').

The effects of this top-down reading pattern are compounded by the fact that search engines arrange results in order of descending 'relevance' and attempt to rank their sources in order of importance and popularity by methods that will be discussed in more detail below. These complex automated judgements are an attempt to offer results that match the user's illocutionary act in searching. As John Battelle points out, 'the holy grail of all search engines is to decipher your true intent – what you are looking for and in what context' (Battelle, 2005:23).

Simulation and dissimulation in a search

Google's interface thus simulates a question-answer sequence. This reverses the classroom discourse patterns of the educational software discussed in Chapter 4. In contrast to the puzzles over hidden knowledge which structured the drill and practice interactions, Google allows the user to 'ask the question'. While the Altavista directory interface, like a newspaper, sets an agenda by offering potential topics that may interest the user, the Google search interface 'gets out of the way' and lets the user select the topic or 'ask the question'. As is explained below, Google and other search engines do also set an agenda by applying a set of 'default values' in the rules which

determine what goes into their index, and the rules that rank and match results, thus influencing what kind of results users are likely to see.

These default values are often discussed in terms of 'bias'. Researchers investigate indexical bias, or whether the index of the search engine fairly represents what is published on the Web. Others have identified ranking bias by studying what kind of sites are more likely to appear in the top few positions for particular keywords. Search engines are seen as 'gatekeepers' which, rather than being impartial and fair arbiters of value, have developed rules or algorithms which accord disproportionate 'visibility' to certain categories of sites. Past research has highlighted these imbalances in relation to commercial sites, popular sites which are heavily linked, and sites from the U.S.

Research has found that, in comparison to sites from other countries, U.S. sites enjoyed a 'cumulative advantage' in that, as the first country to go online, they have received disproportionate attention and they tend to have been established for longer. Consequently, because of the power of the PageRank algorithm, which is discussed below, linking patterns make U.S. sites more 'visible' to search engines than many sites from other countries (Vaughan and Thelwall, 2004; and Thelwall and Vaughan, 2004). This single dimension of bias has to some extent been counteracted by the introduction of national portals such as www.google.co.za. These use IP addresses, localised portals and geolocation to introduce a set of location-biased search results, which (according to my observations on www.google.co.za) are sprinkled over the first page or two of search results.

Cho and Roy (2004) found that the popular PageRank algorithm employed by Google creates a 'rich-get-richer' phenomenon whereby popular pages receive a disproportionate amount of traffic from search engines, which means that they become even more popular over time. Newly-created pages struggle to achieve visibility via this measure (Baeza-Yates *et al.*, 2002). A whole industry of spam and search engine optimisation has sprung up to boost sites' ranking in the search results, which is giving commercial sites higher visibility (Machill, Neuberger and Schindler, 2003). Both of these factors affect web authors in less well-resourced contexts, and in countries where online publishing is a relatively recent phenomenon.

Introna and Nissenbaum (2000) first raised the question of whether the systematic exclusion of certain sites in favour of others and the overall secrecy within the search engine industry was narrowing the Web's functioning in society, and in fact ran

counter to the basic architecture of the Web. Their cautions against segmentation according to traditional lines (categories of content, national identity, demographic categories and so on) or an emphasis on total personalisation of information are still valid and are echoed by a movement which proposes open source engines. Van Couvering (2004) points out that, unlike other powerful media, there is a complete lack of regulation or any public service mandate in the search engine industry or any sense that it should serve the 'public good'.

This chapter argues that the Google interface *dissimulates*, by assuming the stance of a 'good listener', focused helpfully on the user's contributions to the conversation, while, as suggested by the above summary of a growing literature, a very different set of transactions are going on in the background. The claim that the user is searching 'the Web' is another form of dissimulation. In many cases, she is in fact scanning a page or two (at most) of high ranking 'default' links from the Google index.

From a social semiotic perspective, then, searching is not a 'search' or a 'dialogue', but a process of text construction, where the software allows the user first to assemble a query, and second to use the procedural resources of the engine to generate a set of links which in some way respond to her illocution in formulating a query. The channel circuit allows web users to interact with the index, a textual representation of the Web. Google's circumscribed channel uses the words of the query to set up a connection, or to broker a conversation between potential interactive participants.

The simulated 'I'

The user is both audience and actor in the search process, and is depicted in the interface, as what Kress and Van Leeuwen (1996:119-121) call a 'represented participant'. At minimum, this represented participant takes the visible form of a pointing cursor. As an 'interactive participant' the user is also a real person whose actions are signified through mediated effects in the interface. The clickstream (or sequence of mediated actions) is recorded as a log, an artefact used for marketing and personalisation. Within the search engine's procedural representation, the user can manipulate certain aspects of the simulation.

The represented participant is a simulated 'I', which only allows the user to control certain parameters of the representation. For this reason, it is very similar to the pronoun 'you' in written procedural genres – it tells the user what can and cannot be done with that particular interface (its encoded 'affordances'). For example, 'you'

cannot use the cursor to edit the Google logo, or to scribble notes that other users will see displayed on the clean white background.

The Google interface itself is an extended representation of the user's interests, which are foregrounded in the centred layout of the search box, and in the boldly inscribed query terms on the results page. This is also the reason for the extensive use of localised features, both in the interface and the functionality of the site. The Google South Africa portal used by the children and teachers in this study uses several forms of localisation with the primary motive of targeting a more specific audience for advertising and marketing purposes.

Google acknowledges the represented participant by reading the user's IP address, and using 'geolocation' to map this address to a particular localised version of the site. The major purpose of serving up this localised portal is to sell users' interest in particular keywords to advertisers in their region. Organic search results are also localised, to improve the relevance of the U.S.-dominated global rankings. Even when searching on www.google.com, a searcher with a South African IP address will be delivered a sprinkling of results from .za domains for many topics. The lessons observed for this study indicate that these default values have a significant influence on certain aspects of the local curriculum.

Google is a distant multinational corporation, but localisation allows it to create a seemingly closer relationship with the user, by means of representing another interlocutor in the dialogue with the user. This second represented participant in the discourse is the Google brand. Localisation allows Google to assume the guise of a local entity that shares the beliefs and values of the citizens of a particular country. For example, the localised portal 'Google South Africa' uses a default English interface, but offers links to allow the user to change the language of the interface into four of South Africa's national languages. The minimalist graphic design of the site is also used in this way. The three screenshots in Figure 2 were taken on the day of the England vs. South Africa Rugby World Cup in 2007, when the Google doodle was used on two localised portals (www.google.co.uk and www.google.co.za) to express 'support' for both teams simultaneously, while the event was ignored on www.google.com. The portal also allows the user to restrict the search to local information or 'pages from South Africa'. In the terms of this study, the localised

search adjusts itself to become a national 'channel' by restricting the scope of possible matches to the set of domain names that match '.za'.²¹

Google's localizations thus 'hail' or configure a 'South African' audience, and appear to promise a local dialogue. Key representations of the user are hidden. While the interface addresses the user as 'you' in a simulated discourse, another discourse is positioning her rather differently. Here the invisible represented participant is the Google cookie, which, in the software's discourse is more like a third person 'he, she, or it' in the discourse. This representation is stored on the hard drive of the user's computer and configures the interface every time it is used, equating a user with a machine (mistakenly in this case), it depicts the user as a unique Google User ID, with language and interface preferences, a search history, and possibly a Gmail account.

The Google interface also represents the outcome of the conflict between advertisers and marketers who all vie for users' attention. From this perspective then, Google users are contested tokens in an entirely different simulation. Here again they are represented in the third person as individual IP numbers, aggregated 'traffic' and 'keywords'. As Benveniste (1971:221) understood, in language, the third person is not really a person at all, and in fact is defined by Arab linguistics as 'the one who is absent' from discourse. In this way, web searchers have to move between the simulated closeness of the friendly and playful conversation, and the reality of a vast global commercial machine which processes them in the third person.

This study of children searching the Web at Mountainside Primary reveals how the 'rules of speaking' of formal schooling add further complexities to this relation between represented and interactive participants in the simulated discourse.

Internet use at Mountainside Primary

In South Africa, many teachers and librarians have a sense of information which relates to the book as a scarce and expensive thing to be guarded and given out by the teacher or librarian (Hart, 2006). While these physical qualities are absent from digital information, the metaphor of information as object underlies the common talk of computerised 'curriculum delivery' discussed in Chapter 4.

²¹ This in fact excludes many South Africans who publish on domains other than .za.

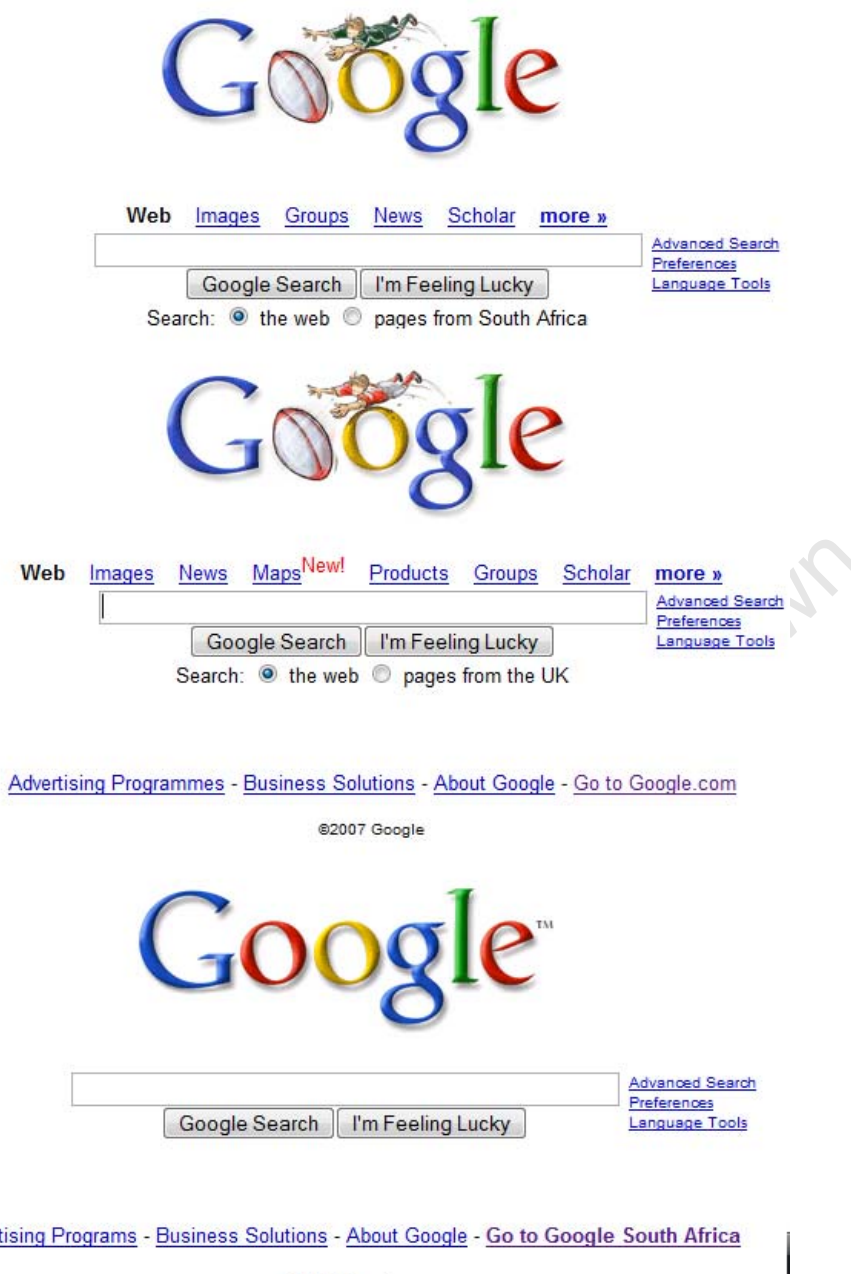


Figure 2. Localised loyalties and the Rugby World Cup 2007 on www.google.co.uk, www.google.co.za and www.google.com

Department of Education officials and the teachers at Mountainside Primary school have varying levels of confidence in computerised 'curriculum delivery'. As discussed in Chapter 4, drill and practice educational software was seen as a relatively straightforward way of conveying 'the curriculum' to children. Opinions about Internet use are considerably more ambivalent.

The Parent Teacher Association at Mountainside Primary has decided that high bandwidth Internet access is a budget priority 'We took the plunge and went ADSL, even though we can't afford it'. The financial implications of this decision entail a significant monthly expenditure for a school that is poorly resourced by many standards. According to the principal, Steven Fransman, when he started working at the school the facilities were wholly inadequate, but, together with the parents, he was able to improve the dismal facilities made available by government.

We had no staffroom, there was no hot water, no ladies toilet. You had to go to the toilet to get water if you wanted to boil water for guests. We would break out the walls on the weekends, and we rebuilt it ourselves.

Despite this creative approach to improving facilities, the school still has no 'proper' library, sports fields, or school hall. In this context the computer lab is a prized acquisition, but every cent which is spent on maintaining it comes at the cost of other dearly needed resources.

Given these constraints on the budget and the perceived power of computers and ICT, Fransman chose to spend the school's limited resources on ICTs rather than expensive print resources: 'We don't believe in any white elephants. If an encyclopaedia is not being used, you won't see it in this school.' The school appears to have used the computer lab to bypass the need to invest in print media and books (other than textbooks). At Mountainside Primary, there is no school librarian, and the 'library' provided by the state is 'a classroom with a few books'.

While the principal agreed that having a school library 'one day' would be desirable, the cost of building up and running a school collection was prohibitive. Rather than spending money on books, the school has invested in ICTs and cultivated links with the local public library.

The principal and many teachers at the school believe that computers provide the key to future employment for their students, in a region where traditional sources of working class employment (particularly in the clothing industry) are dwindling. As Fransman asks rhetorically: 'Is there anyone who doesn't need to work with a computer anymore?'. He explains that he feels responsible for preparing the students to compete in a labour market which can pick and choose labour from a global pool. As he puts it, 'our children have to compete with the world'. Similarly, a teacher

sees the computer lab as a kind of insurance for children who do not complete High School, in which case they would at least have the 'computer skills' necessary for the workplace.

In official discourse, Internet use is marked as the specialised domain of an elite, as potentially dangerous to children, and as a practice which not all teachers can be trusted to understand at a sufficient level. A departmental official responsible for the ICT project raised his doubts with me about whether teachers could be trusted to use the Internet in their classrooms. In his view, the importance of the Internet in the classroom was 'grossly over-rated'. While he was strongly in favour of the programmed instruction in the literacy and numeracy packages discussed in Chapter 4, he felt that Internet access was a considerably riskier investment, because he believed that only highly-skilled teachers and students were capable of selecting from available resources on the Internet, and integrating them into the curriculum. He also felt that the freedom encouraged by web interfaces (or 'aimless Internet browsing' as he termed it) would lead to a waste of the computers as scarce and dearly bought resources.

In an interview Fransman said that teachers were the primary Internet users at Mountainside Primary. While he was impressed that the teachers had made strides in computer literacy, he was aware that Web use presented some of them with particular difficulties, and that not all teachers were at the right 'level' to use the Web in their teaching. In this diagnosis then, individual teachers are seen to lack an ability or 'literacy' which they must somehow acquire before they can use the medium correctly in their teaching. It is equally important to consider how the 'default values' in the search engine's channel circuits also assume a default user, and afford selective visibility to sites through their ranking algorithms. This should be viewed as a cultural and political decision which can be challenged, rather than as a law of nature to which everyone else needs to adapt.

This perspective is also apparent in official departmental projects which attempt to make teachers more efficient users of online media, and possibly less vulnerable to its seductions. The school's ICT facilitator, James Nyathi, was a teacher employed by the Western Cape Education Department to provide peripatetic ICT training and curriculum-related support to staff in a number of local schools who had recently received access to technology. He found his job particularly frustrating since he felt that he was expected to negotiate difficult 'politics' between the teachers at Mountainside Primary and the Education Department's ICT policies. As an example of

these differences of opinion, he cited the e-Citizen certification - an 'end-user computer skills certification programme' developed as part of the European Computer Driving License Foundation (ECDL-F). This EU designed curriculum provides an introduction to online information sources and services and aims to create 'e-Citizens' who are able to search for information and use online services. The name of the program implies that, by 'driving' a computer without such a 'license', citizens will be a danger to themselves and to others (ECDL, 2006).

Nyathi spoke of this curriculum somewhat dismissively, summing it up as 'online shopping and banking' both activities which he and the teachers did not consider to be a priority. He did not personally see a clear connection between the e-Citizen programme and the 'delivery' of the South African educational curriculum which he claimed was teachers' major concern. He also pointed to some questionable assumptions in the curriculum for teachers – for example, the program assumes that buying a CD or book, paying a bill, banking online or making holiday reservations would be 'everyday tasks' for all citizens.

While teachers were not all considered 'ready' to use the Internet, (or resisted the assumption that they should be made 'ready' to do so) the official school policy held that children were only 'allowed' to use the Internet under certain conditions. Children in Grades 5 to 7 were to be given closely supervised access, but they were only allowed to use the Web if they needed to use it for specific projects. They would not be allowed to explore freely, and would only be allowed to log on to certain approved websites. In practice, as the examples in this chapter and in Chapter 3 suggest, Internet access was always freely available in the lab, Google was the web interface of choice for a range of formal and informal activities, and children were given significantly more freedom and independence than Fransman's description suggests. However, the policy does seem to have exerted a certain amount of influence on classroom use of the search engine, as will become clearer in the discussion below.

Despite these restrictive notions and the opposition by some teachers to departmental training initiatives, certain teachers encouraged their children's use of the Web, and used it fairly consistently in many of their allocated lab sessions. The principal's protective approach did not extend to using any filtering software or to changing settings on search engines. Nonetheless, the cautionary atmosphere may have helped to frame Web use as a reproductive rather than productive or creative

activity for the children.²² Teachers understood some of the problems with the educational software, and would point out its content errors to me and to the children, noting, by way of explanation, that it was made 'by Americans'. In contrast, Google's default values were seldom questioned. Googling sessions came to be framed by the 'rules of speaking' that applied to classroom discourse, and Internet texts were accorded the same level of respect which was granted to other scarce resources and textual authorities.

Writing-rights

The prevalence of 'rules of speaking' in defining social interactions suggests that speaking rights are not evenly distributed in society. In extreme cases, some groups of people with low status and power are prevented from speaking at all in the presence of those with high status and power. These inequalities are intensified in relation to the right to use writing, or what Kress calls 'writing-rights' (Kress, 1994:21). He explains how society differentiates between highly valued 'productive' writing (which characterises the original texts of an educated social elite of journalists, researchers, and novelists) and highly routinised forms of writing which he terms 'reproductive' writing (Kress, 1994:34, 41). 'Reproductive' texts are not accorded social status, and can include the texts produced by school children and secretaries. The differences between reproductive and productive writing suggests a differential in social power which separates the 'author' of the text from the scribe, or typist and separates the designer of the template and the clerk who fills in the details. This differential is also present in the limited 'writing-rights' accorded to children in many South African classrooms, and seems to be further intensified in understandings of who has the right to use the Internet. These values are strongly evident in the children's web searches reported in this chapter.

In many South African schools, children's writing falls squarely into the reproductive mode. Hendricks, studying classroom literacy practices in Grahamstown, reports little evidence of productive writing (2007). Research conducted in schools in the Goldfields township schools in the Free State describes children working in classes where very few textbooks and other learning materials are available. Children commonly transcribe from a textbook, or copy the teacher's words from the board (Schlebusch and Thobedi, 2004). Likewise, in the public libraries, teachers, children,

²² This study focused on children's work in the computer lab, and so I did not explore the negative attitudes of those teachers who chose not to make extensive use of the lab. This remains to be explored in future extensions of this project.

(and also librarians to some extent) see the librarian's primary role as giving the children 'a page to copy' (Hart, 2006).

'Copying' is thus a strongly established literacy practice in township schools around South Africa. In this research, the presence of these transcription practices in classrooms and libraries is usually cited as evidence of poor teaching methods, the prevalence of rote learning and the absence of understanding, although researchers seldom ask children and teachers to explain the significance of their practices. The heavy reliance on transcription is also taken to reflect conceptions of the child's limited authority – their role is to reproduce 'facts' and authoritative language rather than to generate their own meaningful texts from the semiotic resources they command. Transcription as a literacy practice certainly testifies to the scarcity and cost of printed material and textbooks in these contexts.

Ironically, many researchers themselves practice transcription as a valued research method which allows for close study of written textual details. Similarly, medieval scribes developed transcriptive literacy practices which reflected their era's emphasis on the authority of certain highly venerated written texts (Spender, 1995).

Transcription thus takes on a meaning in relation to the social practices and physical artefacts that form the context for the act of writing. From the admittedly limited data available for this study, it seems that the Mountainside teachers' and students' use of transcription reflect the meaning of computers as prestigious resources in this context, while acknowledging the physical and economic reality of limited access to a scarce resource. It is also important to acknowledge that people use media (including educational texts) for a range of non-informational purposes (Buckingham, 2007), and that the use of a resource may have a very different meaning in the centre to what it might mean in the periphery. A computer's indexical meaning of prestige might be more significant than its informational value to participants (Prinsloo, 2005) which invites a comparison to the meanings of the English language in a peripheral economy (Blommaert *et al.* 2006). This certainly seems to be the case in some of the Googling sessions that I observed at Mountainside Primary.

Search defaults

Search engine users read the Google interface very differently, depending on how they frame the interaction. For example, 'power users' and search 'experts' treat the engine's interface as a command line which allows them to specify their requirements with the precision of Boolean operators, phrase searching, and specialised search operators (White and Morris, 2007). As this 'power searching'

becomes a way of life for information professionals, and the scale of their information use expands beyond the limits of visual displays on small screens, this search-based approach is shifting desktop user interfaces back to a command line metaphor (Norman, 2007:44).

In non-elite contexts, searching is influenced by very different factors. For example, at Mountainside Primary, children's limited access to the channel, and the power of the 'rules of speaking' in classroom discourse shape a distinct procedural genre of Googling. These factors combine with the default values of the search engine's simulated question-answer exchanges to produce an identifiable pattern of interaction.

Googling with a difference

In Mountainside Primary, Web use usually amounted to 'Googling sessions' where the teacher provided a topic and the children were left to use Google to find (and transcribe) relevant results – often working almost entirely independently for most of the lesson. While children saved digital media (such as downloaded photographs of cars) on the network, the products of the Google lessons were a hand-written paragraph on a piece of paper which went back to their classroom with them.

In the following example the teacher provided the topic for research ('apartheid'), and suggested Google as a place to find the answer.

Erica and Faiza are working together. Erica takes charge of the keyboard, and Faiza takes the mouse. Without waiting for instructions from their teacher, they type in www.google.com into the browser's search field. They are redirected to the google.co.za portal, where Erica types 'apartheid' into the Google search box, and Faiza presses the Enter key. They wait a few seconds for the results to appear, and then click on the first link, which takes them to a page entitled 'The History of Apartheid in South Africa'. They spend the next ten minutes reading the article. When they are done, they copy down the first two paragraphs of the article carefully on pieces of paper that they brought into the lab with them.

Erica and Faiza transcribed the word 'apartheid' into the search engine as their query. They looked at a small set of high-ranking results (only three could be displayed 'above the fold' on the low resolution screen), and chose the first one.

Treating it much as they would treat other authoritative texts such as textbooks and notes from the teacher, they transcribed its first paragraphs verbatim and returned it as their 'answer' to the teacher.

The top-ranking page that the two girls transcribed with such care was written by five second year Computer Science students from Stanford University in 1995. It is a student project which exposes the complicity of computer technology and IBM in particular in facilitating the administration of racial classification under apartheid.²³

South Africa's new National Curriculum (Department of Education, 2002a:6) proposes new approaches to history and social science in order to allow children to participate in a very different kind of conversation about South Africa's past, one that would 'give space to the silent voices of history and to marginalised communities'. The connection between the children and the Stanford website, brokered by the search engine, is clearly a very different 'design for learning' to the conversations imagined by South Africa's curriculum designers.

The girls' frictionless access to the world's information gives them certain distinct advantages over other South African children – both those from previous generations who were educated with the blinkers of Bantu Education and Christian National Education, and those who currently still have to stand in long queues at crowded public libraries to complete their school projects.

Nonetheless there is significant irony in the story. The two girls live in a South African suburb which was defined as a 'coloured' area under apartheid's Group Areas Act, where most adults still have memories of the daily indignities, privations and brutalities of the regime. Yet the search engine offers them, as the 'default value' to their search on the topic of apartheid, a ten-year old student site from Stanford, USA. The irony is intensified if one considers the fact that Stanford is the *alma mater* of Google's founders, Sergey Brin and Larry Page, who built an early version of the search engine for their PhD project while they were students at that university.

²³ The students won a couple of awards for their site at the time they created it. When I contacted them via email, they were most surprised to hear that their project at that stage topped the list of results for a Google query on the term 'apartheid'.

The query results, while co-incidental, do suggest how the social interests and literacy practices of a global elite can be encoded into the rules that govern seemingly neutral software 'tools' such as the Google ranking algorithm. Here it is helpful to remember that Google's ranking is in fact an example of a procedural representation, designed to mediate a conflict between websites. Conflictual discourse is often mediated by software, as in the examples of the election software mediating the contest for votes in Chapter 2, and the verbal contest between the two boys in Chapter 3. In each case it is important to ask what kind of simulation is implicit in the mediating systems. The answer to this question requires an understanding of the construction of the owner circuits in each case.

Search engines are built around the model of a web search as a contest adjudicated by algorithm. Many websites need to attract a large number of visitors or 'traffic' in order to be profitable. To do this, they need to achieve the lucrative position of being among the top ranking sites for the query term in a SERP. Search engines have thus given themselves the task of devising a single set of rules or an algorithm in order to rank websites. They use these rankings to foreground pages with the highest ranking on the results page. The nature of this particular simulation can generate fierce competition between web developers who all want to occupy the prime positions on the search engine's results page. In the contest over competitive keywords, the webmasters often fight dirty.²⁴

²⁴ Search engines provide guidelines regarding acceptable optimisation practices. This is known as 'white hat' optimisation among webmasters, and usually emphasise the importance of using the knowledge of how indexes and ranking can be used to create a real dialogue with users, such as the use of keywords that might be used by the target audience in document headings and titles. In other words, according to these guidelines, content should be created for a specific group of people, rather than for automated algorithmic processing. For 'black hat' webmasters, web design is a game of optimizing traffic and achieving maximum traffic. Here the discourse with potential users is not a real consideration. The only 'real' rules of the game are those executed by the search engine algorithms when populating the indexes and calculating page ranking. Instead, the objective is to top the search engine results page for a chosen keyword, whether by fair means or foul:

This is a game....We try to manipulate the results....and once in a while they catch us at it. Good for them when they catch us....and shame

In this contest then, an automated system is given the power to represent a set of contenders and decide the outcome of a contest between them. The objective counts which underlie the PageRank algorithm 'measure' social interests, in a global context of growing inequities in access to social power and resources.

The girls' query has powerful local resonances in the face of which Google's localization features are entirely inadequate. An early paper written by Google's founders when they were still PhD students at Stanford presents the rationale for the default values which still apply to many searches with this search engine. The paper, which introduced the Google PageRank algorithm to the academic community began with the caveat that '(t)he importance of a Web page is an inherently subjective matter, which depends on the readers [*sic*] interests, knowledge and attitudes' (Page *et al.*, 1998:1). The paper has the subtitle 'Bringing order to the Web', and goes on to introduce the Google algorithm as an 'objective' way of deciding the 'relative importance' of a web page. This shift to an automated editorial judgement claims to remove the potential for overt political bias, commercial interests, and the immense labour costs associated with human editorial judgements. (These were the difficulties on which most human-edited web directories such as Yahoo! foundered.)

on us when it happens....but it is all a game.....albeit a very expensive,
or glorious one! (Forum posting by Percentages, Mar 15, 2004).

One such 'MFA' site (made for adsense, Google's keyword advertising program) currently appears on the first page of results for the search term 'apartheid', where it hijacks a range of Africa-focused keywords in order to hawk hoodia, the African diet drug.

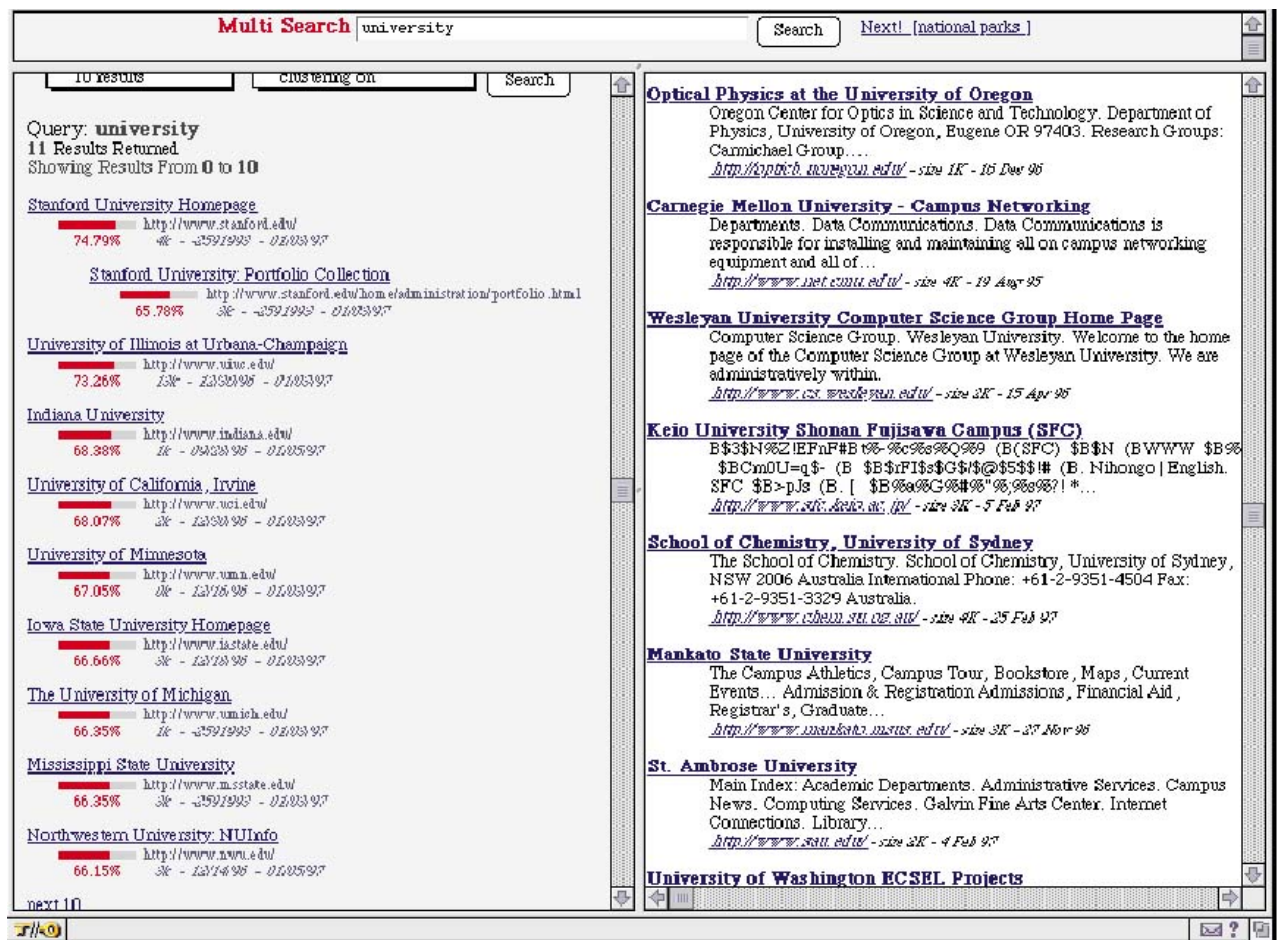


Figure 3: Illustration of a test search with an early version of Google

To illustrate the usefulness of their invention, Brin, Page and their other collaborators ran their proto-Google against its competition Altavista in a contest of relevance. They pointed out that, in response to a search for the word 'university', Altavista returned 'random looking web pages that match the query "University" and are the root page of the server'. By contrast, they show that the Google prototype instead yields 'a list of top universities.' (Page, *et al.* 1998:9). (See Figure 3 for a reproduction of the illustration.) The first two items in Google's ranking are to Stanford University, and universities in the USA predominate.

When viewed in the light of this, the high ranking of the Stanford student project in the search results for 'apartheid' is not random or accidental. The Google ranking algorithm reflects a set of default values encoded in its procedures. By homing in on those sites which have been labelled 'university' by a web author, and by recreating the academic practice of ranking highly cited authorities over those who are less cited, and those who are not considered authorities, the Google prototype is able to differentiate between the home page of a university, and the web pages of

university departments, and research groups. By piggybacking on the human intelligence of the creators of the Web, Google shifted away from the spam-cluttered nonsense of the early search engines. At the same time, however, Google also piggybacks on the social prejudices and preferences of these early web authors.

These rules, without deliberate intention, make it less likely that school children in poorer countries who use search engines would access the local knowledge of the people around them. The original PageRank algorithm rewards older, established pages, and these are very seldom African-based. This makes Google a conversation broker which favours popular sites and sites which get a lot of attention from the other popular sites. In contrast, African countries struggle to get any attention in the media and elsewhere, except around issues of war and famine.

Subsequent to the classroom observations reported here, the Google algorithm has begun to simulate a first-person perspective in that its algorithm now makes certain local sites more 'visible' in the results. Using geolocation it splices high-ranking results from the national domain into the first page of results. This probably reflects a decision to move towards combining 'personalised' with 'objective' measures of value, and has the effect of adding sources written by national elites to the global mix. The difficulties confronting African authors and designers attempting to gain international attention remain significant. Google favours those who have the money to buy attention via public relations, and to boost their ranking with search engine optimization. Finally, Google favours sources which have interested many people, and there are simply fewer people online in Africa than in the U.S.A.²⁵

²⁵ These examples should not be taken to imply a conspiracy or fixed perspective from Google or other search engines. Linking patterns on the Web are dynamic, and ranking algorithms, although trade secrets, are known to have changed to respond to new practices such as spam and blogging. For example, in a result which still seems to be governed primarily by PageRank, the top result for 'apartheid' is now the collaboratively authored Wikipedia entry (the Stanford student project remains second on the list). In the case of the query 'university', Stanford University has dropped down to the fifth page of www.google.com's results, and the highest ranked university is Cambridge, followed by Oxford. The query for 'university' is localised for users of the Google South Africa portal, and retrieves only a list of South African universities, suggesting that it is associated with a possible purchase. Finally, the first three results for the second query discussed in this paper, 'energy what are

Googling as classroom discourse

As per the school policy outlined by Fransman, Googling sessions are controlled and slotted into existing patterns of classroom discourse at Mountainside Primary. In this way, the freedom to ask questions becomes part of the procedural genre of lab and classroom activities governed by the IRF structure. Here teachers ask the questions, and children choose a suitable answer from a limited set of alternatives. In this way, the search engine comes to function as a kind of 'multiple choice' machine. Both teachers and children treat Google like the educational software discussed earlier. However, Google (and other search engines) allowed the children a certain amount of space to explore alternative modes of use, unlike the more rigid educational packages.

Given this context, it seems important to look more closely at dialogue brokered by Google in the above example. What kind of conversation takes place when the search engine acts as mediator, rather than the teacher? On the one hand, the girls seem to be recreating the patterns of classroom discourse, as discussed in Chapter 3. The teacher initiates the dialogue by providing the topic of the research, and suggests Google as a place to find the answer. The girls transcribe the teacher's words into the search engine as their query 'apartheid'. The Google interface offers them a small set of high-ranking results (only three display above the fold). They select the top result and treat it as they would treat other authoritative texts, by transcribing it faithfully and returning this answer to the teacher for assessment. In this exchange, Google and the children are both scribes, who reproduce texts from other sources. Google's designers implicitly invest the Stanford project with authority by giving it the high ranking and the default position, and the girls confirm that authority with their selection and subsequent transcription.

Another observation of classroom Googling revealed a slightly more complex procedure. Here, Dwayne and Hameeda carried out their teacher's instruction to use the search engine to investigate two topics, 'electrical safety', and 'sound energy'. The teacher had given them instructions in the classroom before the children came to the lab. The children typed the following set of keywords: 'energy what are the safety measures [sic]'. The results for the query generated a set of results that bore very

the safety measures', change on a daily basis, suggesting that Google is prioritizing 'fresh' sources, or sources from news sites for a time-sensitive query.

little relation to the topic (see Figure 4 below). Google suggested a spelling correction, which they accepted. Rather than trying another query to look for results that better matched their intentions, Dwayne scrolled down the list of results (see Figure 4), looking for the bolded words by which Google cues a match with a query. He scrolled all the way down the list, up again, and selected the closest match to their keywords, a press release for Massey Energy, entitled 'New safety measures for Massey Energy'. (Massey Energy is a large-scale coal producer in Virginia, U.S.A.) Both children wrote down the first paragraph of the press release, which they reproduced verbatim:

Massey Energy has announced new safety initiatives designed to help prevent underground mine fires and to improve mine fire response efforts. Massey Energy is headquartered in Richmond, Virginia, USA with operations in West Virginia, Kentucky and Virginia (New safety measures for Massey Energy, 2006).



The screenshot shows the Google search interface with the query "energy what are the safety measures" entered in the search bar. The search results are displayed under the "Web" tab, showing 1-10 of about 5,460,000 results in 0.20 seconds. The results include book results, a VietNamNet article about atomic energy, a news article about Massey Energy's new safety measures, and an article about safety measures at Engen in South Africa.

Google Web Images Groups News Scholar more »


energy what are the safety measures Search Advanced Search Preferences


Search: ☒ the web ☐ pages from South Africa [New! view and manage your web history](#)

Web Results 1 - 10 of about 5,460,000 for **energy what are the safety measures**. (0.20 seconds)

Book results for energy what are the safety measures

 Dictionary & Thesaurus of Environment, Health ... - by Smoley, ...

 Canada Enters the Nuclear Age - by Atomic Energy of Canada Limited - 434 pages

 A History of Japanese Trade and Industry Policy - by Mikio Sumiya - 662 pages

VietNamNet - Bill on atomic energy introduced, stipulating safety ...

Bill on atomic **energy** introduced, stipulating **safety measures**. 10:15' 08/06/2007 (GMT+7).

VietNamNet Bridge - A new draft law on the use of atomic **energy** ...

english.vietnamnet.vn/tech/2007/06/703940/ - 11k - [Cached](#) - [Similar pages](#)

New safety measures for Massey Energy

New **safety measures** for Massey **Energy** - 20th September '06'. Featured News. Massey **Energy** has announced new **safety** initiatives designed to help prevent ...

www.im-mining.com/Articles/NewsafetymeasuresforMasseyEnergy.asp - 7k - [Cached](#) - [Similar pages](#)

Safety measures at Engen - SA Instrumentation & Control

Safety measures at Engen South Africa has no option but to follow the green **energy** (which includes nuclear) route ...

instrumentation.co.za/article.aspx?pkIArticleId=3272&pkICategoryId=65 - 34k -

Figure 4: Google search results for the query 'energy what are the safety measures'

When the children had completed their first search, the teacher walked around the lab to check that everyone was on task, and reminded them what she wanted them to do: 'Sound energy first. After that you write down safety rules for electricity. See what they say about sound energy and then go to safety rules.' Thus there appears to be a small but significant difference in the way that the children and the teacher formulated the query. It is ironic that the more mature and academic language in the formal register of the query is partially to blame for the children's lack of success in their search. The phrase 'safety measures' (rather than their teacher's suggested phrase 'safety rules') and the use of the superordinate category 'energy' took them off track. Because they relied primarily on Google's first set of results, and did not adjust the language of their initial query (beyond correcting the spelling error in 'measurs'), the two students did not find any of the sources that the teacher would have liked them to use to complete their first task. They continued to their next search with only a paragraph from a mining company's press release, copied *verbatim*. Two neighbouring children had copied the query from their screen, and received the same results. They had also copied the Massey Energy paragraph and so four children in total left the lab with a press release transcribed from an obscure American energy company.

Google's response suggests a hidden structure in the results. The press release, which appeared in second place, and which four children transcribed, had disappeared from the ranking for their query when I tested it again a week later. Then, and on future occasions, all three first results were a set of news articles, not all very recent, but published on news sites. The fourth result and those further down the page remained in place. This suggests that, on certain topics (perhaps those perceived to be particularly time-sensitive), Google waives PageRank as a ranking criteria, and reserves the default slots in its layout (possibly the first three) in order to rotate recently published articles, or articles from news sources. In other words, an invisible and procedural 'frame' within the results, provides a paradigm within a paradigm, which Google fills with a particular type of content.

It may seem that the problem of 'default values' in a search engine are only an issue for topics such as 'apartheid', and that children would benefit from having access to popular global sources on scientific and technical topics. In contrast to Hameeda's failed search, a Google search with Mrs Karsten's keywords 'safety rules for electricity' led to a large number of online sources written for children. Many of these online materials provided clearly illustrated lists of 'safety rules'. Some of these sources test and reinforce children's knowledge with quizzes and games, and others explain why

electricity can have such powerful and dangerous effects on humans. It is nonetheless worth interrogating even these 'successful' searches and asking what knowledge and interests they bring into the classroom.

The South African National Curriculum for the natural sciences proposes to develop an understanding of science and technology in relation to the local social and natural environment (Department of Education, 2002b). Here, even good online sources are unlikely to be helpful, and in fact, the search for electricity safety rules is unlikely to have uncovered certain prominent dangers to children in contexts like South Africa. It is worth pointing out that in South Africa, and in other parts of Africa, many dangers of electricity are caused because large numbers of people cannot afford to pay for it. Children are shocked and burnt by wires lying on the ground from illegal connections created to siphon power off the main lines, and by the live ends of wires which have been cut in order to remove their copper. Occasional 'load shedding', or power cuts also cause significant safety hazards. Finally, the greatest dangers posed to children around the world by electrical power may well be the future environmental costs of climate change. Dwayne and Hameeda's Google search did not take them anywhere near relevant information relating to such issues, while the children who used the phrasing suggested by their teacher found information supplied as a public relations exercise by energy companies in developed countries. Here again, the way the 'default values' of well-off countries take on a different meaning in less well resourced areas is worthy of serious consideration.

The children were considerably more successful at finding materials for 'sound energy'. The first source they came across was written by children and was clearly illustrated. It had been created for the ThinkQuest competition.

The children read the discussion of sound energy and musical instruments with great attention, and then returned to once again transcribe the first paragraph for their answer. Interestingly, and unlike their previous searches, they continued reading through the Google results even after they had finished their transcription, suggesting that their own questions were unanswered, although they had fulfilled their obligations toward the teacher. Other sites the children explored were written at a level which was far too complex for them. Just as the session ended, Dwayne seemed to be trying to make a connection between kinetic energy and sound energy, and typed in his own query 'kinectic energy' (sic).

Overall, though, in the half hour they had in the lab, the students were hardly able to develop their understanding of the set topic in directions imagined by the national curriculum.

The keyword channel

Halliday (1993:93, 113) describes learning as an essentially semiotic process: 'learning to mean, and to expand one's meaning potential'. For this reason, if we are interested in understanding how children learn online, or how they use language and other semiotic resources as they learn with search-engines, it is useful to take a close look at the grammar of this particular kind of discourse. The traditional approach to teaching how to be a 'Power Searcher' and 'extract' information from a search engine with sufficient precision does not acknowledge the sophisticated knowledge of discourse and genres which makes web searching the use of a lexical genre. Rather than asking *questions*, web searchers learn to mimic the genre, wording, and discourse which characterise the kind of *answer* they want to find. This is suggested by the following entertaining extract from the search log of an anonymous AOL user (Figure 5). The clickstream indicates how the searcher repeatedly reformulates the query in relation to the language and information in the results each query generates, and in response to the information found on the websites.

```
how frogs make babies 2006-04-08 18:34:19
frog roproduction 2006-04-08 18:34:55
frog reproduction 2006-04-08 18:35:02 1 http://www.backyardnature.net
frog reproduction 2006-04-08 18:35:02 3 http://www.colszoo.org
frog reproduction 2006-04-08 18:35:02 4 http://encarta.msn.com
frog reproduction 2006-04-08 18:35:02 6 http://www.towson.edu
frog reproduction 2006-04-08 18:35:02 10 http://cgi.ebay.co.uk
frog reproduction 2006-04-08 18:35:02 1 http://www.backyardnature.net
how to know if frog eggs will hatch 2006-04-08 19:01:59 6
http://www.geocities.com
how to know if frog eggs will hatch 2006-04-08 19:01:59 2 http://allaboutfrogs.org
frog laid eggs 2006-04-08 19:04:09 1 http://allaboutfrogs.org
how to fertilize frog eggs 2006-04-08 19:06:47 3 http://www.berkeley.edu
buy frog sperm 2006-04-08 19:08:40 1 http://www.fotosearch.com
buy frog sperm 2006-04-08 19:08:40 3 http://www.mutantfrog.com
```

Figure 5: Extract from the search log of an anonymous AOL user (User#10215, 2006)

The initial colloquial phrase transforms a question into a description of a target source ('how frogs make babies'), which then shifts to the more academic nominalised phrase ('frog reproduction'). The searcher's dilemma is then again expressed in everyday language, the question is again phrased as a topic 'how to know if frog eggs will hatch'. Next, a truncated snippet of narrative ('frog laid eggs') suggests a search for someone relating a similar experience. Finally, the searcher expresses a goal using a more academic register ('how to fertilize frog eggs') and adds the final, hilarious expression of intent to purchase ('buy frog sperm'). In each case, the language of the query reveals the searcher imagining a discourse with the target website, not only in terms of its content, but also in terms of the imagined relationship of the source with its readers. The 'frog reproduction' query calls for sites which offer scientific information. 'How to know if frog eggs will hatch' looks for a site that offers tips, or an everyday procedural genre, and the final query posits the existence of a frog seller, who will allow the searcher's project of frog breeding to begin.

In brief, Google's algorithms may be good at finding a match, but web searchers have to find the words which are their interface to sources that could potentially answer their questions. The simplicity of Google's visual interface belies the vast complexity of the lexical interface (the millions of individual words stored in the index). In this regard, the detailed transcription of Dwayne and Hameeda's search is illuminating.

The children's formulation of the query suggests that they are asking a question 'What are the safety measures associated with energy'. Here, their language is more explicit than necessary, as the default interpersonal meanings of 'demanding information' are already conveyed by the text entry box, as explained above. In fact, Google strips the grammatical words (and thus the sentence's interpersonal meanings) by treating words such as 'what are' as 'stop words'²⁶. The children's use of the question suggests that they may be responding to the interface's invitation to ask a question (and thus that they expect some kind of an answer). Google provides a response and asks for further clarification of their meaning 'Did you mean: energy what are the safety measures'. The pseudo-cohesion of this response possibly suggests to the children that no other 'repairs' would be necessary to communicate their intentions to the search engine. As Suchman points out, 'as soon as computational artefacts demonstrate some evidence of recognizably human abilities, we are inclined to

²⁶ Stop words are words which are very common in the corpus, and thus slow down the search without adding to the 'relevance' of the results.

endow them with the rest', and she suggests that it is equally important for designers to convey to users 'the ways in which the system is *not* like a participant in interaction' (1987:11).

When asked to explain what they were looking for, both children rephrased their query as 'safety measures of energy'. In contrast to this noun phrase, the query 'Energy what are the safety measures' displays a distinctive 'keyword grammar' by stripping the phrase 'safety measures of energy' of its preposition and rearranging the words. They foreground the superordinate category 'energy' by placing it at the front of the query (Google gives a heavier weighting to the first keywords in the query). The children concatenate this superordinate term with their question without using any preposition. This transformation suggests that they are aware that the syntax of search queries works differently to that of English sentences – they are trying to structure them according to what Battelle refers to as the 'evolving grammar of the Google search keyword' (Batelle, 2005:6). They may be generalizing these rules from the model queries that the teacher suggests before their searching sessions, or they may have remembered a phrasing that the teacher used before they came to the lab.

As mentioned above, it is notable that the children had phrased the teacher's everyday term 'rule' into a more formal register 'measure' for the benefit of the search engine. It is possible that the teacher had used both terms before the children came into the lab. Either way, the children selected a more formal register, possibly signaling meanings associated with prestige and social distance. Both 'safety measures' and 'safety rules' are nominalisations. In contrast, the children's own expressions evoke concrete narratives and processes when they explain what kind of 'safety measure' they have in mind. As Dwayne puts it, 'you mustn't put your fingers and stuff into a plug'. There is very little connection between this understanding and the press release that they write down, but, as mentioned above, it is possible that the informational value of the source is of less significance to them than the fact that they have fulfilled their social obligation to the teacher, within the IRF exchange.

Despite the limited informational value of this search then, the children can be seen to be learning the grammar of keywords and integrating this with their knowledge of visual and English grammar.

Rules of searching

Table 1 represents the 'rules of communication' in the Googling sessions as a composite of at least two overlapping procedural genres which were applied simultaneously in the searching sessions that I observed. In the left column are some of the rules encoded into the Google interface, many of which are guesses, since the actual rules are proprietary secrets and not represented in the interface at all. In the right column is a schematic representation of the 'rules of communication' of the classroom Googling sessions as suggested by my observations and how children seemed to understand what they should be doing.

Table 1 shows that Googling, as a procedural genre, is very different from the educational software discussed in Chapter 4. The literacy exercises provided a rigid curriculum, which both set the questions and defined the answer. The search engine, by contrast, provides few obstacles to interaction, and applies only a minimal set of compulsory rules (marked with the modal auxiliary MUST). At the same time it also controls the interaction 'by stealth' through the use of default values (marked with SHOULD).

As discussed in the above section, local classroom discourse accords the children's use of the Google interface a particular social significance, somewhat unrelated to the content of the website they find and transcribe. The teacher's keywords initiate the interaction, and accept the authority of the engine by not adjusting or commenting on any of the Google defaults. Likewise, the children know what to do before they actually read the article, as indicated from the following sequence in the transcript.

1. Dwayne:[clicks on the link to 'New safety measures for Massey Energy']
2. IM Mining Website: [Massey Energy press release on IM Mining site loads in browser]
3. Dwayne: [points at the beginning of lead paragraph]
4. Dwayne: We start from there [moves cursor to end of paragraph] to there
5. Both children: [start writing down (with pencil and on a loose sheet of paper) the first paragraph of the press release.]

Each child writes down the same words, after which they take turns to read the article together.

<i>Google, South Africa,</i>	<i>Googling at Mountainside Primary</i>
<p>In order to get a list of links on a topic, you:</p> <p>Must be offered the Google cookie.</p> <p>Must have your queries logged by the server.</p> <p>Must press Enter on google.co.za.</p> <p>Along the way, you:</p> <p>Should search on a localised portal with the English interface and local language options; you should also get matches from sites in any language, and see explicit language, but should not see explicit images.</p> <p>Should type important keywords first.</p> <p>Should mean 'and' between your keywords.</p> <p>Should see links to popular sites, especially those with backlinks from other popular sites.</p> <p>Should not see matches to stop words or punctuation.</p> <p>Should see matches to variants of words in the query.</p> <p>Should see advertisements.</p> <p>Should see a few links from .za domains</p> <p>Should see links to articles from news sources on time-sensitive topics.</p> <p>Should choose one of the default (first three) results.</p> <p>May 'feel lucky' and go straight to the default result.</p> <p>May use keywords and spelling suggestions from other people's searches.</p> <p>May request links to an image, newsgroup, news article, or scholarly article on the topic.</p> <p>May look beyond the first page or use an advanced interface to formulate the query.</p> <p>May change your preferences or interface language.</p> <p>Might discover good keywords.</p> <p>Might enter up to 2048 characters, although only 32 keywords will be processed.</p> <p>Might use Boolean and other advanced search operators.</p> <p>Mediated artefact. Your search is recorded in Google's server logs: Google ID, query terms, the time of day, your I.P. address, and the links on which you clicked.</p>	<p>In order to 'write down safety rules for electricity', you</p> <p>Must write down teacher's question in the Google search box and press Enter.</p> <p>Must look for all the teacher's keywords highlighted in bold on one of the results on the SERPs page.</p> <p>Must click through to an answer.</p> <p>Must read through the answer with your partner, taking turns.</p> <p>Must write down the first paragraph of the answer.</p> <p>Should accept Google's default values.</p> <p>Along the way, you:</p> <p>May look for an image to answer the question.</p> <p>May find an answer further down on the first page.</p> <p>Might look for something altogether different</p> <p>Might enter a slightly different question or topic</p> <p>Perlocutionary act You have completed your classwork when you hand in the written paragraph.</p>

Table 1: Google searches (simplified) as procedural genres

Finally, the mediated artefact is of interest. All Google users are offered a 'cookie', or a unique number which identifies them to the search engine, and which is the cohesive tie used to store their preferences and to bind all their queries together for data mining. From the perspective of the owner circuits, in this exchange, the cookie functions as the 'represented participant' which stands in for the user, and which allows surreptitious surveillance of the activities (although they would not be tied to a particular user's identity). The assumption that only one user will be searching at a time informs both the hardware and the software that the children are using. The importance of the identifying information to Google is apparent from the fact that the invisible offer of the cookie is one of the only compulsory steps in the process.²⁷ Similarly, the mediated artefact in this exchange is a form of surveillance which is screened from the user, but which records key mediated events during the search. As a result, in certain dimensions, the search engine 'knows' more about the children's search process than does the teacher sitting on the other side of the computer lab. From a human and social perspective however, the search engine and its designers have little chance of understanding the significance of the events they so assiduously record, or to care about the educational impact of their own role in shaping them.

Conclusion

The search engine index represents the world in single words, numbers and hyperlinks. The searcher's keywords open a channel to writers who are indexed, and who have used those particular words before. The numbers attempt to provide an objective measure and ranking of the social status and the authenticity of the hyperlinked 'neighbourhoods' in which those words have been used. Rather than being an 'objective measure', these values have reflected social standing among an elite, and global patterns of access and exclusion from online communication.

The engine's algorithm or editorial function uses the rankings to select a small number of default sources from the channel for display in the limited space of the screen, thus determining (and reinforcing) the 'visibility' of sources in any single channel. This editorial function is a proprietary secret, and also a moving target, as the search engine shifts from 'objective' to 'personalised' measures of value. As interactive participants, search engine users can currently manipulate the search engine's representation of the world primarily along the axes of the keywords they choose, and how they choose to combine them. As represented participants, they are

²⁷ Users will only not receive the cookie if their browsers are set to a high privacy setting.

characterised primarily by the words they use and the geographical location of their IP address. The keywords have commercial value as an interface to an audience of potential consumers, and targeted advertising such as Google's AdWords program allows marketers to connect the searcher with their own channel.

The new South African National Curriculum aims to move away from the strictures of traditional classroom discourse, to enable different kinds of conversations for learning, and to allow children to engage with silenced and marginalised voices (Department of Education, 2002a:6). The default values of the search engine, as discussed in this chapter, appear profoundly antithetical to many of these ideals. The Googling sessions analysed here suggest the power of classroom discourse, the situated meaning of computing in the local context, and a desire to restrict children's access to the medium. All these factors interact with the default values of the search engine in shaping the curriculum.

Discussions of bias often imply that bias is undesirable, and that it can be corrected to reveal an objective truth. A search engine algorithm generates representations of the Web, and like other representations, these will be motivated by social and commercial interests and thus convey (many different kinds) of bias. Understanding how these complex interests play out, and how particular political and economic contexts have played a role in shaping both search engine, and the social value of information on the Web is the first step to addressing this issue, as Fabos (2004:95) suggests.

New ways of mediating learning dialogues, such as search engines, should receive at least as much scrutiny from teachers and other educators as textbooks and other learning materials currently do. Currently proposed open source search engines would make decisions and rankings more transparent, and thus promise to give users more control of the conversations they select.

The discursive structure of queries, the nature of the index, and the network of discourses, selections and transactions which generate any search engine results page are worthy of study in themselves, by children, teachers, and classroom researchers. The discursive metaphors of search engine interfaces should be questioned, and lessons could explore the power of using written language to define a custom channel, and to adjust it. In the process, new practices and identities can be brought about, as children use search engines both to mirror the known and map the unknown.

More fundamentally, however, there are other channels. The Google search for 'apartheid' is now topped by an entry in Wikipedia (the Stanford student project has been relegated to second place). Read/write sources such as Wikipedia suggest the possibility that children around the world can record local voices and enter the fray to inscribe their versions of stories alongside the global versions of history, science and other subjects.

Beyond that, there are other sources. The world represented online is currently defined by those who have historically, had 'writing-rights'. A South African archivist comments how histories and experiences which are not digitally recorded can vanish from sight:

There is the danger that everything that is not digital will not only become unimportant but also will, to all intents and purposes, cease to exist, so whatever is available on the Internet becomes THE history – all there is (Pickover, 2005:9).

This chapter argues that the search itself is a representation which can be controlled as an expression of other individual and social identities, and understanding how this plays out, including its seemingly irrational and playful dimensions, will help to design new ways of searching, to build search engines which acknowledge the social power of their default values, and which give more people control of the representations they generate in this way.

Chapter 6: Holding the floor: Discourse and Player versus Player combat in World of Warcraft.

There's no fun in owning someone if you just look at them as so many pixels.

(Blades)

As discussed in the previous two chapters, South African children's social surroundings are changing, as new forms of mediated communication and Internet use bring about changes to their 'environment of communicative possibilities' at school (Jones, 2002:11-12). In contrast, in Europe and the U.S.A., many young people have had access to the Internet at home for more than two decades.

The following two chapters provide an account of the diverse range of mediated communication and 'mutual monitoring possibilities' (Goffman, 1964:134) available to the young online gamers who congregate with their friends in guilds on the European servers of World of Warcraft. For these players, their surroundings now encompass a vast fantasy world and their context embraces thousands of potential discursive participants. While South African students experience a scarcity of digital resources, in Europe, broadband Internet access is so easily available that young players are able to focus their leisure activity on a form of interaction which is entirely mediated, and which does not require a shared embodied spatial experience. Despite this contrast, parallels can be drawn between the two contexts. These parallels illustrate the power of the situational meaning over the software's architecture. They also reveal certain unique dynamics introduced into both contexts by the software systems. In both contexts, the software's procedural resources are contested resources used to differentiate between distinct groups of participants, and they are designed to support the interests and valued activities of some, while ignoring and often hampering the activities of others.

In the previous chapters we have seen that the procedural resources of the software available to young children at a low-income South African school are limited by the framing practices of classroom discourse, and by software which was not developed to support the local national curriculum. The participation practices and 'writing rights' in the localised design of the software, and the values suggested by the way in which participants are represented in the system (the children's grades and Google's tracking cookie) suggest how the software serves the administrative interests of the school and teachers, and the commercial interests of the software designers.

These theoretical concepts developed in Chapters 4 and 5 can also help to explain many aspects of the interactions of the online gamers, despite the difference in context. The next two chapters focus on applying the analytical concepts and methods developed in previous chapters to the complex forms of mediated communication which take place in online gaming environments. The theory must be extended to account for the different architectures of interaction associated with multi-user online discourse, namely that players use the software to communicate multimodally with one another as well as with the game system.

In the mediated leisure spaces enjoyed by young European gamers, the constraints of poverty, or histories of racism and global inequality are not as glaringly obvious as they are in the South African context. Nonetheless, micro analysis of interactions reveals the significance of power relations between participants in their contest for representational resources, and in particular the importance of gendered identities. Once again, as in the case of educational software and search engines, these power dynamics are expressed in a complex hierarchy of ownership and clientship in the use of channels of communication. Representational economies also give rise to gaming behaviours similar to those encountered in Chapter 4's discussion of children using educational software, while the central value of 'winning' among players and in the game's representational system intensifies the competitive dynamic within player communication.

The following two chapters analyse players' semiotic work within two distinct guilds of players from Blizzard Entertainment's highly successful massively multiplayer online role-playing game (MMORPG), World of Warcraft. These two groups of players may play the same game and have characters on the same server, but their experiences of gameplay are shaped by very different norms of communication, which give rise to two distinct genres of the game

This chapter analyses the nature of multimodal interaction in multiplayer games, where combat extends one player's 'writing rights' onto the character of another player, thus allowing one player to 'own' the in-game representation of their combatant. Just as children and teachers followed the 'rules of communication' of the classroom, as documented in Chapter 4 and 5, this chapter shows how interactions around game-based combat develop the contest genre, a key form of masculine discourse. Chapter 7 documents the activities of a group of players who selectively subvert the game's rules to construct their own mediated experience, and, where necessary, move their activities to a channel where they have greater control. The use of these two highly divergent contexts to develop theory illustrates that, in both a well-resourced and a marginalised social group, a contextual multimodal discourse analysis can help to explore the power dynamics associated with software use, both for users and for the system's owners and designers..

This study departs from accounts of games which treat certain kinds of 'constitutive' rules as formal systems and intrinsically 'mathematical structures' which exist independently of the player (e.g. Salen and Zimmerman, 2004:98,102,132). Instead I argue that, from a social semiotic perspective, the rules of Player versus Player (PvP) combat specify a distinctive form of procedural communication between players. Even considered as a purely mathematical system, the game's rules specify a representational interaction between players. When given a particular shape and metaphor in World of Warcraft, these rules of representation assume particular social associations and meanings. In support of this argument, a combative exchange is analysed in terms of its encoded 'rules of communication'. I argue that combat is a stylised version of the verbal contest genre (Parks, 1986:439) (like the insult game discussed in Chapter 3). Combat gains further meanings in relation to player discourses, in this case the specific traditions and history of a PvP guild interact with broader social discourses of masculinity associated with some versions of the PvP playstyle.

Beyond the specific example analysed in this chapter, this form of analysis offers a way of accessing a player's experience of gameplay. Just as classroom discourse patterns are encoded into educational software, and the question-answer exchange is simulated by the search engine, the discourse of combat suggests particular interactional relationships for players, to which they may react in a variety of ways. Just as a conscious understanding of the representational conventions and 'grammars' of images helps visual designers (and particularly students of visual design) to understand the visual experience and reading paths they are creating,

understanding the discursive patterning of an exchange can help game designers to find new patterns, and can help game scholars to understand and critique current practices.

Players of multiplayer games use game media and procedures as resources to communicate with, impress, entertain, win victories over, and harass other players. Players make choices regarding their characters, skills, talents, gear, actions, and verbal communication as they interact with the virtual world and other players. Characters, speech, and combat are all forms of self-representation for players, who read other players' identities via the numbers or 'stats' of their characters, the mediated events of combat and the text and speech conveyed via in-game chat channels. Within the PvP playstyle, the numerical representations or 'stats' and 'build' of a player character are accorded a higher modality than, for example, the character's visual appearance or role in the game narratives.

Turn-taking is a major focus in the analysis of verbal conversations, in that turn-taking and (in online discourse) 'holding the floor' reflects participants' perceptions of social power in a conversation. This study reveals that turn-taking in combat displays features which centre around literally 'holding the floor', or taking control of the other player's represented participant, and thus silencing their opponent. The proxemic relations of represented participants are particularly important in this discourse. Software as a medium affords concealment as a communicative act. In this way, players are able to exercise surveillance over other players. Thus an analysis of communication should include the 'rules of seeing' as well as the 'rules of speaking'. Here it is necessary to consider in what ways the player decides to be visible or to 'screen' their presence, activities, and words from other players.

The nature of discourse in computer mediated communication has generated a substantial literature which analyses the characteristic features of synchronous online discourse (see Herring, 2001 for an introduction). These studies are usually focused on the linguistic interactions of text chat, rather than on the multimodal exchanges associated with games where the verbal message is not foregrounded in the exchange. I argue that PvP combat in online games is a rule-governed communicative exchange where players are temporarily allowed to affect the in-game representation of other players, and where they aim to use the mediated artefacts of combat to improve their own status.

Some of the situational and gendered meanings of combat are explored through the use of player diaries from a particular PvP guild, The Girl Guides, which are contrasted with an online . These exchanges of combat have many similarities to other, more verbal conflict genres. In these genres, for example 'the dozens', masculine identity is asserted through the exercise of a verbal power-play (which often takes the form of an insult to the opponent's mother), or another female relative (Vrooman, 2002). Other genres, such as Internet 'rants' and 'flames' aim to silence the opponent, but, in both cases, the speaker gains status from the clash with his opponent through the exercise of representational power (Vrooman, 2002).

A multimodal discourse analysis reveals the interactional patterns of this exchange. A player-created gameplay video is discussed as a multimodal communicative exchange between two players, where the usual conversational principles of co-operation and politeness are temporarily (and consensually) suspended, and the players, rather than interacting verbally, bring about negative changes in the opponent's represented participant. The event is analysed as a spatial interaction, and as an exchange of a particular duration. The turn-based patterns of interaction, which are collaboratively established in verbal conversation, are governed by the game system in PvP combat, and players use these rules in order to control their visibility to one another, to take charge of the conversational 'floor', and to silence or immobilise their opponents. Their goal is to ensure that the game system represents them as the winner, and the opponent as the loser in combat.

Taking turns and holding the floor

As mentioned in the previous chapter, in verbal discourse, speakers are accorded different 'speaking rights', depending on their social position (Kress, 1992). Conversation analysis shows the complex processes by which seemingly equal participants jostle for the next turn, and for the attention of other speakers in conversations (Pomerantz and Fehr, 1997; Cameron, 2001). In text-based computer mediated communication (CMC) turn-taking is not governed by the restrictions on speakers talking at the same time (Herring, 2001). Instead, in online discourse, participants only 'hold the floor' if their contributions to the conversation are ratified by others participating in the online conversation. What is going on in a particular conversation is defined collaboratively and interactionally (Simpson, 2005). By contrast, in PvP combat, the need for ratification by the other participant is absent, and the characteristic freedoms of CMC are reduced – in combat, players hold the floor at the expense of the other player, rather than by courtesy of gaining their attention and holding their interest. Ultimately, the winner gains status at the expense

of the loser. This conflictual form of interaction generates specific social relationships of power over other players whereby players talk about 'owning' or 'pwning' one another in combat. These relations are often accorded particular gendered meanings.

According to Wikipedia (which is probably the relevant encyclopaedic authority on such matters) the gaming slang word 'pwn' may have originated from the common mistyping of 'own' (the letters p and o are right next to each other on the qwerty keyboard layout). Alternatively, it may be a portmanteau word of 'pure' and 'ownage' ('Pwn', see Wikipedia, 2008). I prefer the mistyping theory, which is supported by other deliberately misspelled terms ('teh' instead of 'the' and '1111!!!!11!' instead of '!!!!!!!!!!'). These misspellings are used both to suggest the incoherence and excitement associated with victory in online games, and to parody the experience from a slight distance. The origins of the word suggest some of the specific meanings of losing in online games, where the term 'own' is used hyperbolically to underline the interpersonal humiliation of losing and to boast in an exaggerated way about the successful domination of a rival. In terms of the current discussion, it is also revealing to note that the term 'pwn' is commonly used in the context of computer security to describe a successful hacking attack – here a hacker gains an authorised administrative control of software owned by someone else – a computer, website, or server ('Pwn', see Wikipedia, 2008). In this case the term connotes a rebellious form of defacement and penetration, while associating it with a game-like contest to gain control of software which belongs to someone else.

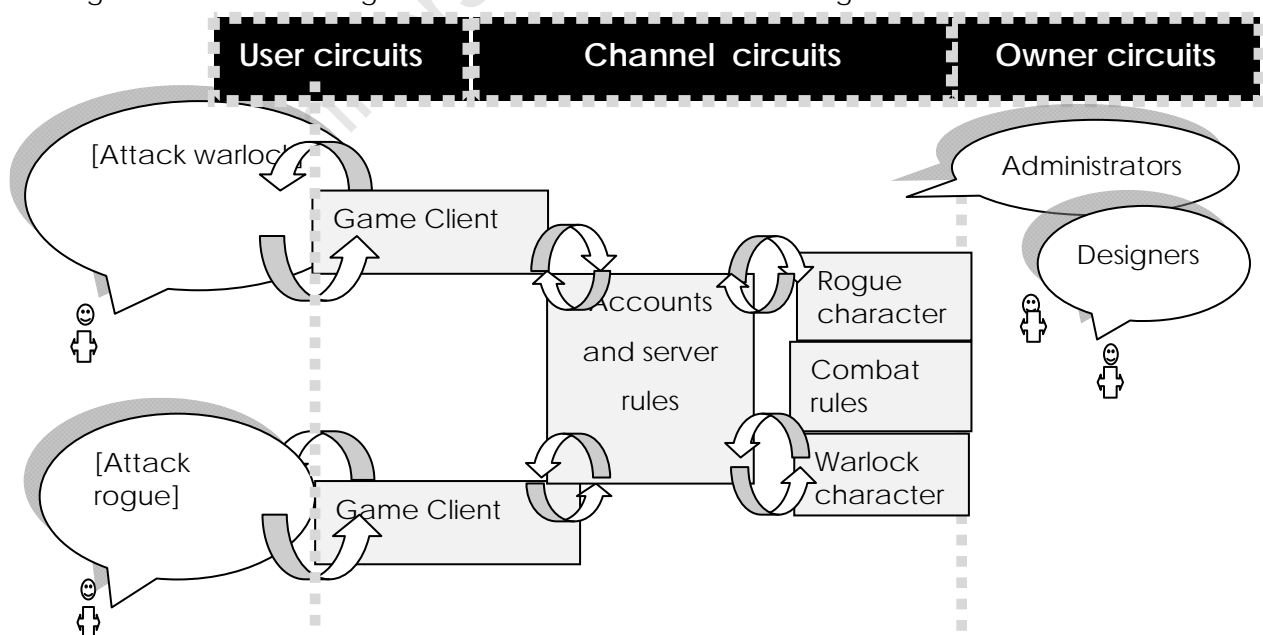


Figure 1: Simplified production-reception circuits in 1v1 Player versus Player combat

The diagram in Figure 1 indicates how multiplayer communication changes the experience of using a networked system. In games such as World of Warcraft, players (or interactive participants) communicate via their represented participants, which are their game characters. These interactions always take place by permission of the game's developers, who also represent the players as 'accounts'. In the case of World of Warcraft, Blizzard Entertainment claim ownership of both the user and channel circuits (the game client) and the owner circuits (the game server), forbidding players to tamper with the operations of the client (by using hacks and bots), to set up their own servers, or even to sell their game characters, gold, or levelling services to other players.

World of Warcraft

World of Warcraft was launched in 2004 and soon had the largest subscriber base of any MMORPG in the U.S.A. and Europe. In January 2008, Blizzard Entertainment announced that World of Warcraft had just over ten million subscribers worldwide, including two million in Europe, more than 2.5 million in North America, and about 5.5 million in Asia (Alexander, 2008). The revenue from the game is substantial, since it is sold on a subscription basis – players must pay monthly subscriptions after buying the game, and then also pay for any expansion packs (which are sequels that introduce new areas in the world). The expansion pack *The Burning Crusade* was the top selling computer game in 2007 (Sinclair, 2008).

As an MMORPG, World of Warcraft is descended from pen and paper role-playing games (Fine, 1983), which were in turn adaptations of the genres of fantasy literature inspired by the work of J.R.R. Tolkien. These games gave rise to text-only software adaptations known as MUDs (multi-user dungeons) which were some of the earlier genres of networked games. MMORPG's in turn adapted the MUD formula with the addition of a visual channel. This provided perspective rendering and an interface which simulated a real-time camera moving through a three dimensional scene. Nonetheless many of the rules of the earlier pen and paper, and text-based genres remained unchanged (Mortensen, 2006).

In World of Warcraft, players control a character, which is their primary vehicle for exploring a large and complex game world. The character must be selected from ten 'races' (which include humans, elves, trolls, orcs, dwarfs, or undead). Once they have selected a character, players' primary activity is to encounter 'monsters' or non-player characters, and to 'fight' against them in a repeated series of miniature

contests of varying levels of difficulty. Each character class is specialised for its role in combat – ‘melee’ classes fight up close and can take ‘damage’, or survive the attacks from powerful monsters, ‘ranged’ classes fight from a distance, ‘damage per second’ classes deal damage in order to kill the monster, and ‘healing’ classes heal other players. With each successful contest, the character gains ‘experience’ and slowly levels up to the ‘level cap’ (which is currently 70), gaining specialised ‘talents’ and ‘skills’ along the way.

This activity of battling monsters and exploring new territory is known as Player versus Environment (PvE) gameplay. Players may also elect to engage in combat against one another. This is known as Player versus Player (PvP) gameplay and is the focus of this chapter.

Game servers and rulesets in World of Warcraft

In World of Warcraft, players’ divergent styles of play and different possible objectives in the game are accommodated to some extent by deploying slightly different versions of the game rules on four different types of server (also known as ‘realms’) available to players. In one type of realm, the PvP (Player versus Player) servers, players may fight against other players anywhere in the game world. The second type of realm, a PvE (Player versus Environment) server, has a different ruleset, which disallows players killing other players outside specially demarcated zones. The major focus on PvE realms is thus combat between the player and the ‘mobs’ or monsters in the game environment. Although PvP play is possible on these servers, it must be consensual. On a third type of realm, the role-playing servers, players abide by a ruleset which encourages players to play ‘in character’ and to generate improvised narratives together. Role-playing servers use either the PvP or PvE rules.

All major kinds of play can be experienced on most realms. The Argent Dawn role-playing realm is the focus of this study, and, although the ruleset on Argent Dawn is that of a PvE server, PvP combat is popular among many players.

Contrasting goals

The following two chapters discuss gaming communities which revolve around two quite distinct types of gameplay and where multimodal discourse is dedicated to different goals. These differences are not adequately addressed in the current literature on World of Warcraft, which tends to focus attention on the dominant Player versus Environment playstyle. Quantitative studies suggest that players on PvP servers

'level up' faster²⁸, possibly because they are slightly more achievement oriented, since this gives an advantage in combat. These studies find it difficult to characterise role-playing servers, equating role-playing with an increased rate of flirting, and dating between players (Ducheneaut *et al.*, 2006). Oddly, this account does not mention players' central interest in narrative or improvised dramatic styles of play, which is one of the key issues discussed in Mortensen (2006). Although role-playing and PvP communities are discussed separately in the following two chapters, players often participate in both kinds of interaction, and belong to more than one community. Players also use role-played and PvP discourse simultaneously. (In fact, Blizzard introduced RP-PvP servers in response to the demand from their player base for this particular combination.)

PvP gameplay in World of Warcraft

World of Warcraft divides players into two warring groups or 'factions', the Horde and the Alliance. This combat with other players is the central focus of players who adopt a PvP playstyle. Players from both factions share a single visual channel, i.e. they can see one another and engage in combat, but their verbal interactions are limited. They can also only communicate across the faction boundaries using a small set of 'canned' gestures, such as /hello or /rude. These commands generate two different multimodal communicative ensembles, or 'emotes' – /hello is a friendly greeting with an animated wave, and /rude is an insulting comment and rude gesture.

PvP guilds focus their gaming activities around combat with the other faction, and emphasise the numerical rankings of players' achievements in the game's Honor and Arena system, as I will explain below. Individuals aim to improve their status, and to rank over other players. As Williams *et al.* (2006:344) explain, PvP teams are smaller and considerably less formal than the large raiding teams required to take on the instanced dungeons of the end game, and the experience of playing in a PvP team resembles a small group of friends 'heading to the park to play some team sport'. In contrast, World of Warcraft's guild interface is designed to support the more militaristic organisation of the large raiding guilds, which are also considered the most 'glamorous' kind of guild.

²⁸ 'Levelling up' refers to the process of incrementally making a character more powerful and efficient in game combat by incrementing the various components of its numerical representation (or its stats) so that it can fight against more powerful monsters. This process is particularly important in role-playing games.

PvP can take the form of combat between players anywhere in the game world, or in specialised gladiatorial 'Arenas' or battlegrounds.²⁹ Even on the same server, players have developed a wide range of playstyles..

A multimodal discourse analysis demonstrates how the procedural resources of the game are interpreted and shaped by the two communities. Here, as in the case of software, a semiotic approach can tease out what Steinkheuhler calls 'the mangle of play', or the complex relationship between player communities, their norms, and the encoded rules of the game, where communal norms can 'amplify, enhance, negate, accommodate, complement, and at times even ignore hard-coded game rules' (2006b:200).

Guilds, closeness, and surveillance

Players are able to create their own custom channels for their guilds and other small groups of players. This allows guild leaders and officers to exercise a limited form of ownership within these channels. Within World of Warcraft, players can join 'guilds', or associations of players who quest, raid and socialise together. When invited to join a guild, a player gains access to a custom chat channel, and wears the 'guild tag' below their character name on their avatar. Guilds vary in style and organisation, and have a significant influence on a player's friendships and overall experience of the game (Williams *et al.*, 2006). The guilds discussed in this study fall on the boundary between medium and large guilds as defined by Williams *et al.* (2006). Although membership fluctuated, both of the guilds that I studied had about 30-40 members during the period of the study),

²⁹ Arena PvP is probably the aspect of World of Warcraft which most resembles traditional games and sports, and it is televised on the WSVG (World Series of Video Games). It is intensely competitive and overall PvP winners are announced when the Arena standings are published every Tuesday. The Arena system allows players to compete in small teams for overall top position on their server or battleground (a cluster of servers). This position is expressed as a number, and is known as 'standing'. A player whose team has a standing of over 2000 is considered to excel at this form of PvP. Key issues for PvP players are their level (or cumulative 'experience' in the game, the equipment or 'gear' that can give them key advantages in combat, and the 'build' of their character (A build is the combination of talents chosen, thus creating particular strengths and weaknesses.)

Guild members can see information about other players which is not available outside the guild, and thus their view of one another is 'closer'. Guild members can 'see' when last someone logged on, and they can also read the comments that guild members and officers add to annotate or describe players. As Taylor (2006b) points out, this close-up view sometimes extends to using interface modifications which provide 'surveillance' of players' performance in combat. In fact, this 'surveillance' is also a form of representation. The guild channel and interface is a channel which has owners (the guild leader and officers) and users in a relation of clientship (the members). Within this channel, 'writing-rights' (Kress, 1994:21) are unevenly distributed, since, in most cases, officers reserve certain rights for themselves. Officers can wield the power to 'name' other players by inviting them to the guild, and by allocating and naming ranks, thus naming the other players.

In electronic environments, hierarchical game structures are expressed in a non-reciprocal visibility, and this applies particularly in the channels that are available only to higher-ranking members of guilds. Guild officers have dedicated channels which are only accessible to officers. As Johan, one of the officers in The Girl Guides explained:

[Y]ou watch your minions scrabbling away in /g [the guild channel] and coolly comment on their childish behaviour in /o [the officers' channel].

In the typology of guilds suggested by Williams *et al.* (2006), the Girl Guides more closely resembled the unstructured and free-wheeling approach to organisation of a 'tree house play space' rather than the militaristic and hierarchical organisation of certain raiding guilds.

Modality

In semiotic terms, digital games can be understood as multimodal procedural representations. As in the case of all software, games are essentially automated adaptations of internal numerical representations.

In language and other semiotic systems, modality markers are used to allocate truth value and social force to a representation, and are also used when reading a message, to interpret how truthful or how serious the consequences of a message might be. As Kress and Van Leeuwen point out, we 'routinely attach more credibility to some kinds of messages than to others' (1996:159). For example, in language,

modality markers such as auxiliary verbs are used to communicate whether a statement is considered real or true ('He might arrive on Tuesday'), and to suggest how forcefully a command will be applied 'You must arrive on Tuesday'.

Kress and Van Leeuwen point out that 'what is regarded as real depends on how reality is defined by a particular social group' and that these definitions are associated with conventions of what is considered high modality in all semiotic modes (1996:163). They show that, in visual design, the scientific realism of abstract diagrams disregards surface detail and individual difference in favour of depicting generalisable or regular features, and rules which cannot be observed with the naked eye. This contrasts with the naturalistic realism of photography, which attempts to recreate the perceptual experiences of human vision. The modality markers of naturalistic realism are those of 35mm photography, and here the resolution of detail, rendering of colour and range of tonal variation characteristic of this type of photography have become synonymous with 'realism' in everyday parlance (Kress and Van Leeuwen, 1996:163). Thus both of these systems are high modality markers, or are considered markers of 'truth' by particular communities in particular situations. Modality, according to Kress and Van Leeuwen (1996:159) is a measure of the truth value of a particular representation within a specific social context, or 'the question of the reliability of messages'.

Sign-makers are always interpreting messages in relation to the following kind of question: 'Is what we see or hear true, factual, real, or is it a lie, a fiction, something outside reality?' (Kress and van Leeuwen, 1996:159). In scientific discourse, numbers (and statistical tests of their significance) are accorded a particularly important role in establishing the generalisability of a particular finding, or to what extent it can be translated into a general rule. In software systems, numbers are accorded an additional high modality, because they are the basic form of all internal representations in computers. As explained in Chapter 1, they are subject to the logical operations of quasi-semiosis, and can be processed automatically. Consequently, scores and PageRank are the key modality systems in the educational software and search engines discussed in Chapters 4 and 5.

For the same reason, in digital games, numbers are accorded a particularly high modality as compared to other semiotic resources. Salen and Zimmerman are applying a scientific system of modality when they explain to aspirant game designers that the 'formal' or mathematically represented rules of a game are somehow more 'real' or 'actual' than the social conventions associated with play

(2004:134). For game designers, these rules do have a particular importance, in that these are the only rules of the game which can be operationalised by a machine. Consequently, they are also highly significant to players, particularly to those who value an efficient, quantitative approach to gameplay and adopt patterns of instrumental play or 'power gaming' in which numbers, and the rules by which they are manipulated, play a key role (Taylor: 2006a:74).

While there is a temptation to regard a quantitative representation as a 'hard' fact, numerical representations are treated as real by social conventions, which are open to challenge. For example, Taylor (2006b) draws attention to the way in which 'damage meters' are used by World of Warcraft players to compare individual contributions to a joint undertaking. She points out that these numerical scores may misrepresent players, and that they may distort the gameplay experience so that players focus only on those elements of the game which are represented by the damage meter. The presence of other, competing modality systems in the same game leads to interesting social dynamics. Burn and Carr show in their discussion of Anarchy Online that players can be motivated primarily by respectively representational, ludic, or communal aspects of the game (Burn and Carr, 2006:104).

Similarly, in my study of World of Warcraft, distinct communities on the same server established competing modalities or 'truth values' (an understanding of what is more important or real). Players tend to associate with and learn from others who have similar motivations, although, as Burn and Carr note, players do often enjoy more than one style of play. Role-players, who are motivated by the representational dimension of the game, work together to create characters who play out collaborative stories that enhance the immersive and dramatic fiction of the world. For these players, Azeroth is a world of trolls, elves, undead, orcs and so on, all with their own history, in which the player characters play a small part.

When players have ludic motivations, they focus on the experience of play, but this does not mean that they are not keenly interested in the game as a system of representation. They are particularly interested in the numerical representations of their achievements within the game system, which constitute a particular form of represented participant. Semiotically, they focus on a different mode of representation – often numerical rather than narrative. In the case of World of Warcraft, players focus on elements such as levels, 'gear', and statistics. I would argue that these ludic motivations are a key part of players' identity projects. The game character is the represented participant in the game, and its stats, talents and

gear are a nominalised narrative of the player's achievements, playstyle, and understanding of the game system. Players with a ludic motivation are engaged in a form of self-representation, and they apply a similar set of interpretive rules when they 'read' the represented participants of other players. As these descriptions suggest, both ludic and representational dimensions of gaming are underpinned by social relationships between the players.

In this chapter, I discuss a PvP guild where potential members conform to a particular gaming-specific version of 'bad boy' masculinity and ludic prowess. I explore some of the complex semiotic practices associated with this playstyle by analysing a short sequence of PvP combat, and considering it in relation to a particular style of masculine banter. In the following chapter, I present a contrasting example – a role-playing community which values the representational modality of improvised narrative. In this community, traditional literacy and other discourse markers are used to decide who gets to join the server's 'elite' role-playing guilds.

Games as numerical adaptations

Just as movies may be adaptations of narratives originally developed in a novel, so games are multimodal adaptations of numerical representations and operations.³⁰ This is the case for many traditional (non-digital) games, and for their modern digital successors. To explain the combat game in World of Warcraft it is helpful to consider the role of numerical representation in a far simpler, but distantly related game, and so I will take a short detour via the history of the popular children's game, Snakes and Ladders (also known as Chutes and Ladders).

There is a tendency in game studies to view the rules of a game as its 'underlying formal structures' which are 'logical and mathematical' in nature (Salen and Zimmerman, 2004:130). In fact, certain kinds of game rules, even at their most abstract, simulate a social situation, and define interactions which are stylised versions of conversational exchanges. The following discussion illustrates the process of translation which takes place between the formal mechanics of a game and its cultural meanings.

³⁰ Thank you to Lesley Marx for suggesting this comparison.

The formal definition of a game of Snakes and Ladders is a game of addition and subtraction, where opponents take turns to add random numbers (one to six) to their total with the aim of reaching the sum of exactly 100 before an opponent does. In contemporary versions of the board game, the ladders and dice throws add numbers to a player's total, while the snakes subtract from it. The formal rules of the game are not a purely abstract representation outside of human culture. The process of the game, even at its most minimal (as depicted in Table 1) also specifies that at least two opponents should be engaged in a process of turn-taking, and that at the end of the process one of these will be the winner. Thus even in this rudimentary and abstract form, it is possible to see that Snakes and Ladders is a discursive interaction, governed by strict 'rules of communication', where the objective of the exchange is to represent each player by means of a number. The winning state of the game reflects the cultural assumption that a higher number is better.

Turn		Dice throw		Player's position
		Snake -	Ladder +	
1	Player 1	3		3
2	Player 2	5		5
3	Player 1	4		7
4	Player 2	6		9
5	Player 2	5	12	26
6	Player 1	1	3	5

Table 1: Turn-taking in Snakes and Ladders.

The Victoria and Albert Museum in London displays historical versions of the predecessors of the modern game Snakes and Ladders. The game originated in India, and there were Jain, Muslim and Hindu versions. It was used to study religious concepts – in the spatial metaphor of the game, players were ascending to Nirvana, or descending through death and reincarnation to the lower tiers of life as they moved around the board. A Jain version of the game ('*gyanbazi*' or '*gyanbaji*' which means 'Game of Knowledge') is depicted in Figure 2 (Victoria and Albert Museum, nd). As Salen and Zimmerman (2004) point out, the use of the spatial representation and a dice in the modern game handles (and hides) the game mechanics of generating random numbers, and the operations of addition and subtraction. The different versions of the game suggest the role of figurative and spatial meanings in the game. As depicted in Figure 2, the Victorians also adapted this game, substituting

a Christian narrative and renaming the snakes and ladders according to their particular understanding of moral vices and virtues.

Once again, these versions of the game still work in ways which resemble a conversational exchange, or a strictly rule-governed discourse. After all, the game, like a conversation, is a rule-governed sequence of moves, or turns, which enact a particular social relationship. To use the terms discussed in Chapter 5, the game tokens can be seen as represented participants in the mediated discourse, while the players are the interactive participants. The players' progress through the game is now more than just the numerical meaning of 'bigger' or 'smaller' (and the cultural reading 'bigger is better'). Instead, a multimodal ensemble of meanings comes into play. The position of the square on which the token is positioned has a particular, culturally defined meaning in relation to the overall composition of the board – notice how the Jain design in Figure 2 uses a centred composition, whereas modern boards are organised around a left-right reading pattern.

In a visual dialogue similar to the voter's mark on the ballot in Chapter 2, the player's token makes a particular square salient to them, and associates them with the meaning of the square on the board and its position. Finally, there are the visual and verbal representations on the board. Here, for example, the words 'greed' or 'sloth' combine with an illustration of a greedy and slothful person, a picture of a long snake, and the sinful one receiving an appropriate punishment at the bottom of the ladder. The player whose token lands on this square has consented, by joining the game, to undergo this vicarious experience of punishment, most often in the hope of achieving a winning outcome (or for some other interpersonal reason, such as entertaining bored children). A crucial dimension of the meaning of the game is the conversation or discourse that takes place around the board – in these conversations, rules are explained and negotiated, the interpretation of dice throws are discussed and decided, turn-taking is managed, and players communicate whether they are serious about the game, whether they contest the interpretation of a dice throw, or, in the case of the game's historical variants, whether they are using the game as an opportunity to discuss religious or moral teachings. The players' turn-taking is thus a stylised and ritualised form of multimodal discourse. The game is a communicative event where the 'rules of communication' of the event as a whole enfold the procedural meanings of a game. As in the case of the educational software and the Googling sessions discussed in chapters 4 and 5, these situational meanings ultimately determine which version of the game is played, and what meanings it will assume for players.

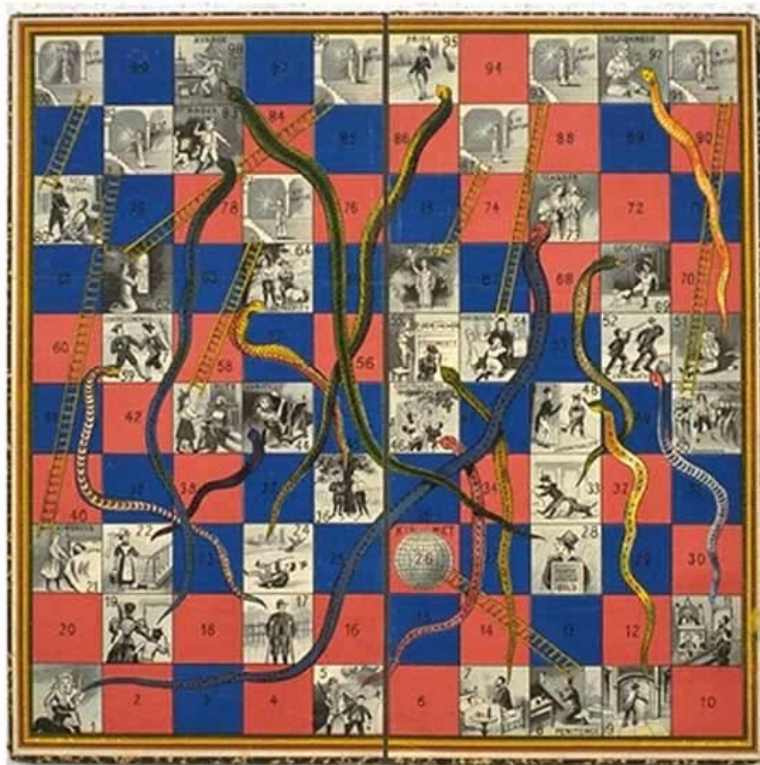


Figure 2: A 19th century Jain version of Snakes and ladders (above) and a 1895 Victorian version of Snakes and Ladders (below) (V&A Museum, nd)

The combat game in World of Warcraft

While players of Snakes and Ladders in Victorian England sought to beat their friends by being first to attain the lofty symbolic rewards of moral behaviour, in World of Warcraft PvP combat, players seek to 'own', or kill other player characters, as explained above.

In World of Warcraft, a relatively simple game mechanic is built into more complex structures. This chapter aims to explain the workings of this game of combat, and then to show the meanings associated with this game by specific player communities. In World of Warcraft combat, as in the game of Snakes and Ladders, players are also essentially engaged in a game of addition and subtraction. Rather than representing the players' process of ascent to heaven, the addition and subtraction game is used to manipulate two numbers which each represent a player's state of 'health'. Players in combat start at full health, and the attacks on their health, or 'damage' (similar to snakes) subtract from this representation until it reaches zero – when the player 'dies'. Players can also improve the state of their health (and this is the equivalent of a ladder), by adding to their health as they 'heal' their wounds.

In Snakes and Ladders, a random dice-throw is used to determine the changes to players' position on the board. In World of Warcraft, players are said to be 'attacking' one another when they change one another's (represented) state of 'health' through the mathematical operations of the game of combat. Herein lies the ritual aggression of the simulation – players have consented in advance to having their representation changed by another player, and so individual 'attacks' during combat can be simultaneously non-consensual and socially acceptable.

Players' turn-taking is strictly rule-governed in most board-games. In Snakes and Ladders, each player has only one turn at a time, unless one of them throws a six, as in Table 1 above. Turn-taking is far more flexible in computer-mediated communication than during face to face speech, and this also applies to turn-taking in combat. In World of Warcraft, turn-taking is less strictly governed than verbal conversation, but the game's design imposes a basic rhythm of turn-taking within which players must work within in order to win. Turns in combat are rationed through a special resource allocated to each character class – these resources are known as 'rage', 'energy', and 'mana'. The player 'spends' this resource on certain specialised attacks, and must wait for it to be replenished in order to be able to use these attacks again. Another turn-taking mechanism is the game's system of 'global cool-downs'

which means that certain spells can only be used once, after which they must recharge over a period of time, or a 'cool-down'.

Finally, in World of Warcraft players receive sets of 'talents' which can improve their prospects in certain types of combat. In the rogue class, for example, players can choose special talents in 'subtlety', which improves their ability to vanish from sight. Alternatively, they can choose 'assassination' talents, which allows them to inflict very large amounts of damage very quickly, or 'combat' which means that they deliver more damage to opponents while taking less. The particular combination of these talents and how they interact with weapons in gameplay affords players endless opportunities for experimentation and discussion. Players have no access to the exact numerical 'balance' by which their chosen talents improve their performance in combat, and, until recently, it was not easy to find out what talents another player had selected. Through play, dedicated players are able to uncover the hidden algorithms which determine the dynamic inter-relationships between all these factors in the game's ruleset, and these discoveries are shared and debated with other players, as in the discussions analysed by Steinkuehler and Chmiel (2006).

Proxemics

In society, the spatial relations between people are used to communicate and enforce their social relations. The language of such spatial and social relations is known as proxemics, which deals with the often unconscious ways in which human societies have handled time and space, as a form of communication (Hall *et al.*, 1968).

When speakers interact, the distance between them expresses their social relationships – and these proxemics in turn encourage certain kinds of communication to take place. A 'close personal distance', for example, allows a level of intimacy not possible to those who are not intimately acquainted, or to those who are standing at a distance from one another (a range of 'public' or 'social' distances) (Hall 1966:110-20).

Spatial proxemics are also present in visual media, where they provide an important part of the interactive meaning. Kress and Van Leeuwen discuss the way in which shot scale (close ups and long shots) gain some of their meaning because of the Western system of meanings for proxemics between individuals. They relate this system to Hall's sense of the invisible boundaries which, in Western culture, differentiate the meanings of distance, as follows:

- Close personal distance (an intimate distance for embracing or whispering).
- Far personal distance (which allows conversations about personal involvements).
- Close and far social distance for conversations among acquaintances, where impersonal business is conducted.
- The public distance between people who are likely to remain strangers (Kress and van Leeuwen, 1996:131).

In other words, part of the meaning of a mediated conversation lies in the represented distance between the conversing individuals. Spatial arrangements, which can be fixed, semi-fixed, or dynamic, suggest a tone for a conversation, and can underline or contradict the messages of the words that are spoken. Eye contact is an equally important part of a conversation, and can be perceived as intrusive. Through a quick gaze, we make contact and show interest in further social contact, but a protracted stare can be considered extremely rude.

Combat in World of Warcraft also has strongly proxemic meanings, as spatial proximity and orientation, and character class and equipment (such as weapons and armour) determine a player's position of relative strength or weakness in combat. The rogue class must get up close to their opponents in combat in order to use their daggers and poisons, while mages and warlocks need to be far away to use their powerful ranged spells. These spatial meanings affect turn-taking, just as certain conversational moves become unavailable to speakers when they are not in the correct proxemic relationship to their interlocutor. For embodied individuals, the smooth gradations of social proxemics respond to the perceptual relationship to the other person (intimacy, for example, is measured by to what extent you can touch and smell the interlocutor). Proxemics in game systems work very differently, in that they operate within the simulated three dimensional space of the game, and they obey rules specified geometrically as an area of influence, or a range. These are all or nothing relationships governed by the affordances of Boolean logic. Targets are either in or out of range for certain attacks.

Methodology

In this chapter, I transcribe and analyse an 11 second video of two players engaged in the simplest form of Player versus Player combat (also known as '1v1') in order to identify some of the encoded and social 'rules of communication' which pertain to this particular combat game. I have used multimodal discourse analysis. Since multimodal communication is so complex, and is generated from complex rules, I

have had to be selective. My transcription focuses on the sequence of events and their relationship to the game's turn-taking rules and player strategies rather than dwelling on all the visual and aural metaphors used to illustrate the battle (which would also provide a very interesting analysis). I selected the simplest form of combat between players in order to allow for a close analysis, but more complex situations (where more than two players are involved in combat) also require analysis with this methodology and could yield a whole range of other insights related to the team dynamics in PvP.

As explained in Chapter 3, I conducted this study of World of Warcraft players through a virtual ethnography on Blizzard's European Union Argent Dawn role-playing server. During this process, I asked selected players to record and annotate video diaries of their gameplay practices. Johan, the player who recorded the gameplay video that I analyse in this chapter, was a member of the rogue guild that I established at the time of the fieldwork for this chapter (January – June 2007). My rogue guild was not Johan's primary guild. In addition to the character who belonged to my role-playing guild, a network of assassins and spies, his main character, a level 70 undead rogue character called Blades, belonged to a PvP guild, known as The Girl Guides. Johan recorded one of Blades' excursions to the Alliance capital of Stormwind for me. He provided annotations on the video in which he explained his objectives, strategies, and the complex semiotic activities which PvP combat requires.

Another member of my assassin guild, who played a level 70 undead rogue called Wodahs, had also been a member of The Girl Guides, and via my friendships with these two players, I was introduced to that guild, and met several of its former and current members. At the time of this study, the Girl Guides had, until very recently, been a leading PvP guild on the server.³¹

The Girl Guides was founded by a female player, Desarae, who was widely admired in PvP circles as a highly skilled player. In Johan's terms, Desarae was motivated to play and win at PvP as 'one of the boys'. At one stage, her guild had two of the highest ranked PvP teams on the server, and her own 3v3 team was first on the server, and third in the Bloodlust battlegroup. Johan explains that she won acceptance through her ludic virtuosity at PvP, and inclusion in the particularly masculine style of banter that prevailed in the guild. More than this, as I describe below, she was able to

³¹ The name of the guild has been changed to protect the anonymity of its members.

wield the power of guild gatekeeper to determine who else qualified to join the exclusive clique.

Admission to The Girl Guides required excellence and dedication to PvP. This excellence was measured partly in terms provided by the game mechanic, but partly also in terms of less measurable qualities – a player's reputation among his or her peers. In the terms of the game's 'Honor' system, players would strive to achieve PvP titles which display above their heads, such as 'Warlord' or 'High Warlord'. Thus the game mechanics supported a certain grading or scoring of excellence. This grading told a story of the player's experience and dedication, and was communicated to other players through titles allocated to players from the militaristic and hierarchical set of PVP titles.

At the time of my fieldwork, the Girl Guides guild was semi-defunct, as the guild leader had stopped playing, and many former members had left the guild. Among the role-players of Argent Dawn, The Girl Guides were somewhat notorious. Players and the guild itself were regularly reported for breaking the server rules and during the period of this study at least one member was banned from playing on the server. As will be discussed in Chapter 7, some members were regarded as 'leet kids', or as players who disrupted other role-players' gaming experience, sometimes by 'ganking' or killing other players in ways which were regarded as unfair, but also by acting 'out of character', and thus destroying the role-players' immersion in the game world.

Johan's annotations of the PvP video helped me to realise how combat had very specific meanings to him which were associated with his membership of The Girl Guides. For Johan, success in the game of combat against another player signified the performance of a certain kind of masculinity, which he also expressed through his guild membership. Although my approach in the study as a whole was ethnographic, I did not join the guild, and so I collected the stories of The Girl Guides as an outsider who got to know some of the members, and knew others from their reputation on the server. I relied on interviews with my guild mates, screen shots of the guild interface, and screen shots collected for me by other former members. This data nonetheless provides a valuable picture of a PvP guild, a type of guild which is not discussed in any detail by Williams *et al.* (2006) in their typology of World of Warcraft guilds.

My focus in collecting the data was to document players' own semiotic practices, in the interest of understanding their experiences of 'meaningful play' (Salen and

The combat game in World of Warcraft

As explained above, Combat in World of Warcraft is essentially a statistical competition between a player and another player, or a non-player character (NPC) or monster ('mob'). During combat, the player's commands (or illocutions) are used to trigger game events (which are the mediated actions of software). These events subtract and add to a player's health, give them special abilities ('buffs') or disabilities ('debuffs'), and also change other aspects of their character's state. These system events are represented to players in the three dimensional perspective view of the game, the textual and numerical record of the combat log, and the game interface or 'heads-up display'.



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Azeroth. For example, in Figure 3, Johan's character Blades, an undead rogue, is fighting a dwarf warlock in the Alliance city of Stormwind.

In ludic terms, the perspective view provides important visual, spatial and relational information – information which is integral to gameplay. A wealth of additional information is coded into the 'realistic' scene using sound effects and animated versions of comic symbols – these are visually cohesive representations of special attacks and abilities and their effects on the opponent ('buffs' and 'debuffs')

Heads-up display

Superimposed on the perspective view is a second representation of combat. This two-dimensional representation is known among players as the 'heads-up display', or HUD, and is named after the military and aviation HUDs where a transparent display of information is projected on a window while allowing a clear view of the scene outside. In World of Warcraft, the HUD is semi-transparent, and is composited over the perspective scene. In the default view, when a player character enters combat or targets another player, an icon representing the attacker or 'target' appears next to the player's icon in the HUD (see Figures 3 and 4).

Following a common gaming convention, the icon also has an integrated graph representing health points and the class's special ability (such as 'mana', 'energy', or 'rage'). As the player's attacks reduce the target's health points and vice versa, the player can compare the changes in the two animated graphs and thus gauge the likely outcome of combat.

Combat log

The default heads-up display includes a text log of game events – the combat log. The combat log is an automated, textual record of messages sent by the game server to the game client. Its sentences record all the events of combat and their numerical quantities, for example the amount of damage done by a particular spell. The combat log is a record of the exact numerical progression of the events in combat. Unlike the transient, animated components of the game, the combat log is available to be consulted after the conclusion of combat.

An extract from a rogue's combat log would look like this:

Your Backstab crits Dredge Stalker for 1298.

You have slain Dredge Stalker!

Dredge Stalker dies, you gain 462 experience. (+181 exp Rested bonus)

Rogue versus Warlock video

The gameplay video that I will analyse in this section is a record of combat between Johan's character, an undead rogue, and a dwarf warlock. In World of Warcraft, warlocks are ranged attackers who use arcane energies to dispose of their targets at a safe distance. Warlocks use demonic pets (a relatively harmless voidwalker in this case) and specialise in 'damage over time' spells, which consume their reserves of 'mana'.³² In contrast, rogues are specialised melee damage dealers, and have the ability of 'stealth', which allows them to get up close to their targets without being detected. Rogues have access to a wide range of special abilities, which consume their reserves of 'energy'. Rogues are fast at killing, but only wear leather armour; for this reason they can also be fastest to die – they must be close to their target to be effective and this often subjects them to significant damage when they are caught out of stealth.

Carr uses Genette's concept of 'simultaneous narration' to explain the specificity of computer game narratives (Carr, 2005:39). Like sports commentary, this constitutes a form of narration that is almost exactly 'contemporaneous with the action' (Genette, 1980: 217;).

The combat log and the animations and sounds of combat are an automated record of performatives created by the game system from player commands. My transcription of the video focused on identifying the particular performatives that were used in the encounter – both the game events (or mediated actions) and Johan's names for what he was doing (or his illocutions), as suggested by the discourse he used when discussing his strategies in the annotations.

³² The warlock's pet's contribution to combat was minor, and so, in the interests of clarity, it was not included separately in the transcription.

Time	Rogue's move	Warlock 's move
00:00	Rogue sneaks up on his target, a Warlock, while in <i>Stealth</i> Rogue assesses target	
00:03	Rogue prepares for combat with <i>Premeditation</i> and moves close to Warlock	
00:05	Rogue immobilises the Warlock with <i>Cheapshot</i>	Warlock is immobilised and 'silenced' by <i>Cheapshot</i>
00:06	Rogue opens combat with <i>Backstab</i> and <i>Cold Blood</i>	Warlock's <i>Pet</i> , a voidwalker, retaliates by attacking Rogue.
00:85	Rogue attempts <i>finisher</i> with <i>Eviscerate</i> and <i>Misses</i>	
00:90		Warlock is free to move now & tries to get away (at range)
00:10	Rogue follows, staying behind Warlock without standing still, uses <i>Cloak of shadows</i> to dispel warlock's <i>Damage over Time</i> spell and lands <i>finisher</i> with <i>Eviscerate</i> ,	Warlock retaliates with <i>Curse of Agony</i> , a <i>Damage over Time</i> spell
00:11	Rogue kills the Warlock , The win is recorded as an Honor point for the Rogue.	
Glossary ³³		
<p>Backstab is a Rogue ability, a hard-hitting move that can only be performed from behind the enemy. It only works with a dagger in the main hand.</p> <p>Cheapshot An opening move of the Rogue class which is used from stealth and stuns the target for 4 seconds. Awards 2 combo points.</p> <p>Cloak of shadows instantly removes all existing harmful spell effects and increases the chance to resist all spells by 90% for 5</p> <p>Combo points are accumulated as special attacks (<i>builders</i>) are performed against an enemy, and are then spent as extra damage added to other special attacks (<i>finishers</i>). The more combo points built up against an enemy, the greater the damage of the finisher.</p> <p>Crippling poison is applied to a rogue's weapon. Every time the rogue hits with the weapon, there is a 30% chance of the victim being slowed for 12 seconds, which helps to keep them in melee range.</p>		<p>Curse of Agony A Damage over Time type spell.</p> <p>Damage over time (DoT or dot) refers to inflicting some damage on one's foe which will be applied at a regular interval for a limited duration. Typically in World of Warcraft the damage is applied every x seconds.</p> <p>Eviscerate is a powerful finishing move which deals a relatively large amount of damage independent of the rogue's weapons.</p> <p>Finisher A finishing move which deals additional damage</p> <p>Miss A random factor which results in a player's attack not hitting its target.</p> <p>Premeditation adds two combo points to the target.</p> <p>Stealth prevents other creatures from detecting the stealthed player (or mob) unless particularly close. The chance of detection increases with proximity and other factors.</p> <p>Trinkets are a form of armour and give passive effects or produce an effect for a brief period.</p>

Table 2: Abbreviated transcription of Rogue versus Warlock combat video

³³ These glosses are sourced from Johan's explanations and www.wowwiki.com

I also created a spatial transcription of the interaction, to convey a sense of the proxemic relations which cannot accurately be expressed in a verbal transcription. A short version of the transcript of the video is provided in Table 2. The names of the actions in italics indicate the use of special spells, abilities, and attacks from the game, such as 'eviscerate' and 'cheapshot'. The transcript of the game video is annotated with Johan's strategies. It also provides a glossary for game terms.

In the clip (illustrated by the screenshot in Figure 4), Johan's character is in Stormwind, a capital city of the Alliance, where he uses the rogue ability of 'stealth' to sneak up undetected on a level 70 gnome warlock. Thanks to the surprise attack and his somewhat inept and underpowered opponent, Johan is able to finish off the warlock with very little difficulty in about 11 seconds of active combat. After this he can vanish from sight without attracting any further attention.

Johan's annotations of the videos he recorded provide a glimpse of the complex, semi-automated gestural sequences, and the simultaneous multimodal reading and design practices in which players are engaged as they test their skills against other players. In written comments (similar to the elicitation methods used in face to face research), he explained what he was doing during the attack and noted his purpose and strategies.

Controlling visibility and surveillance

Johan used the rogue ability of 'stealth' to edit himself out of the scene as represented participant. In this way, he could conduct a brief surveillance of his opponent, gather the crucial information about her talent build that he would need in the fight, and evade attention from enemies while he prepared himself for the fight. He guessed that the warlock was specialised in 'affliction' and 'demonology', and this reading turned out to be correct.³⁴ The behaviour and gear of the character function like indexical signs – just as smoke can be 'read' to infer the presence of a

³⁴ Blizzard's online 'Armory' interface allows players to search the World of Warcraft database and reveal the hidden 'build' of their opponent, as well as the gear they have equipped and their standing or level of experience and expertise in PvP (11). The Armory reveals that Johan's 'reading' of his opponent was highly accurate. As he predicted, her talents were concentrated firstly in 'affliction' and secondly in 'demonology'. The Armory reports this particular Warlock's build as follows: 37 (Affliction) 19 (Demonology) 5 (Destruction).

fire, so this particular player behaviour is read to suggest what kind of player she is, and her likely talent build. PvP gameplay depends heavily on this form of surveillance.

Surveillance is a key element of the asymmetrical social relationships of multiplayer combat. As discussed in Chapter 3, Jones (2002) points out that mediated discourse functions as an involvement screen. Before entering combat with the warlock, the rogue manipulates the ability to screen her character from view, both through the 'stealth' ability and also by moving around in the simulated three-dimensional space of the game. Looking at someone is a way of penetrating their individual spatial 'bubble'. In Western culture people are unlikely to make sustained eye contact with strangers in public places – places where we do not want to converse with a stranger. Given these social conventions and taboos, it is perhaps not surprising that seeing someone without being seen yourself generates particular power and pleasures.

Controlling spatial relationships

Once visible, Johan controls the timing and spatial relations (proxemics) of the fight carefully in order to optimise the effect of his own turns in combat. He also controls the 'floor' of the interaction by keeping the warlock immobilised and 'silenced' or unable to use any of her abilities, as represented in the spatial transcription in Figure 4.

The spatial transcription of the interaction in Figure 4 indicates how Johan waits his turn, and moves right up to the warlock, where his melee abilities become available. He keeps the camera at a distance, in order to continue his surveillance of the scene as a whole. His 'cheapshot' immobilises her and renders her unable to use any spells for the first five seconds of the fight. When she is able to move again, he moves around rapidly without stopping, and swings the camera around.

The difference in control of the situation is apparent from the spatial transcription. The warlock moves only once, slowly and over a short distance (marked between C and E in the diagram), as she attempts to get at range. In contrast, the rogue's movements are unfettered, and he covers a large area very quickly (marked with a black 'F' in the Figure 4).

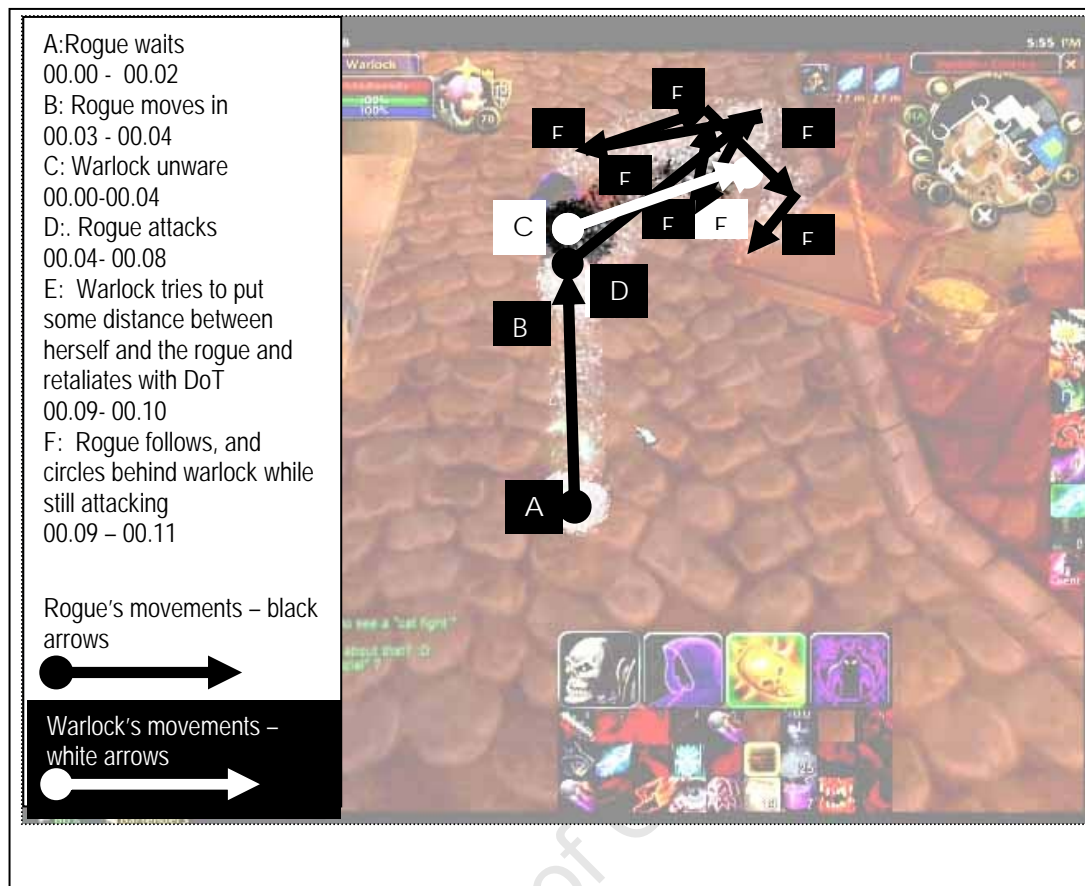


Figure 4: Spatial transcription of combat video

Johan explained that he had been moving in a typical rogue pattern, where he was focused on staying behind the warlock, so that he would have access to his full repertoire of attacks. In this way she would also struggle to target him and certain spells would remain unavailable to her:

I'm trying to stay behind the enemy so I can backstab her and keep her from using abilities or spells that require LoS (*Line of Sight*), if she can't see me she can't target me. The spells she *did* manage to land are DoT spells that do not require that you stand still or even that you see your target. (Johan, annotated game video diary)

Thus skilled PvP players literally 'take the floor' by dominating the spatial relationships between the participants in combat. Once again, they do this in order to make their most powerful attacks available, and to control the proxemics and mutual monitoring

possibilities of the game space in order to use their most effective weapons and spells.

Controlling turn-taking

A final analysis of the sequence is provided in Table 3. Here the interaction between rogue and warlock is represented in terms of the individual interactional moves as represented in the combat log. (These do not include the spatial movements discussed above). These are represented as 'sentences', with the duration of the mediated action of each sentence represented on the timeline of the interaction.

In World of Warcraft combat interactions, and all other interactions, are constructed from a simple subject-object-verb structure, which is represented visually in the interface (see Figure 5), and verbally in the combat log.

Player characters are the represented participants in a scene. The player character is the 'subject' of the multimodal sentence that is represented at the top left of the heads up display. Procedural resources such as spells, attacks, and abilities function as 'verbs', which are applied to another represented participant as the 'object' of the action, or in game terms, as its 'target'. This targeted represented participant can be another player character, a non-player character, or the player's own character.



Figure 5: World of Warcraft combat represented as a visual sentence in the HUD.

The selected target is highlighted in the three dimensional scene, and it also appears to the right of the player's icon. In Figure 5, the 'Target's target' is also displayed, which creates a relationship of subordination in the 'visual sentence' (a structure which Burn and Parker [2001] refer to as a synchronic syntagm). This visual relationship could be translated into English as follows:

Rogue targets warlock (who targets rogue).

Table 3 shows that, by communicating their combat 'sentences' to the game system in this way, players generate a complex multitrack 'mix' of simultaneous mediated actions and effects. In this particular type of discourse, each player tries to 'take the

floor' by dominating the sequencing of the discourse and 'silencing' the opponent (by taking away their ability to use their most powerful attacks). Thus it is clear from Table 3 that the rogue dominates the beginning and end of the interaction, although there is a short period in the middle (between 00.08 and 00.10 on the timeline) where he loses control.

Unlike verbal language, many of these attacks can be active at a time, just as different instruments in an orchestra combine into a single piece of music. Consequently, another way of taking the floor is to 'stack' a large number of simultaneous 'buffs' and attacks or to issue several attacks over a short period of time, as the rogue does when initiating combat (between 00.03 and 00.04 on the timeline).

Table 3 also shows that, although the players are the represented subjects of each sentence, the game system in fact decides on felicity conditions for each performative, or whether the player's illocution, as expressed by a keypress, is converted into a mediated action. For example, at 00.08 on the timeline, a random element in the game code results in the rogue 'missing' an 'eviscerate' attack, thus losing control of combat. Johan comments on how the warlock failed to take advantage of this potential moment to turn around the fight:

This is where I lose control of the fight, the warlock is free to act now... We *are* in a capital city, there's lots of guards around who could finish me off. But, the warlock's player was most likely a bit shaken about getting jumped and slapped fairly hard by me, so instead of sending me running away in 'terror' into the guards, she foolishly throws a harmless [damage over time spell] on me instead. (Johan, annotated game video diary).

Subject		Object											
		Verb											
		00.00	00.01	00.02	00.03	00.04	00.05	00.06	00.07	00.08	00.09	00.10	00.11
Rogue	Rogue	R: Stealth											
Rogue	Rogue	R: Premeditation											
Rogue	Warlock	R: Cheap shot											
Rogue	Warlock	R: Backstab (critical)											
Rogue	Warlock	R: Combat											
Warlock (auto)	Rogue	W: Combat with pet (voidwalker)											
Rogue (auto)	Rogue	R: Trinket											
Rogue	Rogue	R: Cold blood											
Rogue	Warlock	R: Miss (Eviscerate)											
Warlock	Rogue	W: Curse of agony Shadowy embrace											
Rogue	Warlock	R: Crippling poison											
Rogue	Warlock	R: Eviscerate											
Rogue	Rogue	R: Cloak of shadows											

Table 3: Player versus player combat turn-taking on a timeline.

'Health' is probably the player character's most important attribute, and each successful attack reduces the opponent's health by a certain amount of damage. This change is reflected in the game's state, in the HUD, and the combat log. It also triggers particular animations in the *opponent's* character, including the final 'dying' animation. In this way, combat allows one player to manipulate or change the represented participant of another player in an unflattering way, just as insult genres give license to young men (primarily) to play with insulting each other, or, more often, insulting one another's female relatives. Once again, this suggests that combat is a multimodal 'insult', and, like other contest genres, can be used to signify a 'resolutely masculinist display of the prowess and skill of a chosen identity' (Vrooman, 2002: 64-5).

Combat game as procedural genre

The interactive structure of a game-like procedural genre is apparent from the representation in Table 4. These rules show the character of the interactive relationship in PvP gameplay. This relationship can be described as one of consensual compulsion. The second rule in Table 4 relates to the player's consent to the combat interaction. This signals that both players consent to the combat and is an important framing message, which is needed to differentiate the physical violence simulated in the characters' interaction from the aggressive, but nonetheless ludic interaction between the players. Also, note that players signal their illocution, or offer to engage in combat, in advance. In this way the players consent to combat without losing the suspense associated with the simulation of ambush, or, in Johan's words, the potential to be 'jumped' (As an example of the shifts between these two frames, consider Johan's use of combat metaphors such as 'jumped and slapped pretty hard' to describe what he had done to the warlock.)

In order to win in Player versus Player combat you:

Must have an up to date subscription.

Must have consented to combat (i.e. you must be flagged for PvP combat, be playing on a PvP server, or be in a space demarcated for Player versus Player combat such as an Arena or battleground).

Must attack or be attacked by a player character.

Must reduce your opponent's health points to zero before they reduce yours to zero.

Must have your actions and your opponent's actions represented in the combat log, in the character graphs, and in character animations for all players to see.

Must not engage in certain game actions which are not legal during combat.

Along the way, you

Should use a default attack once you enter combat.

Should win if you are more than a couple of levels higher than the opponent, or if the balance between your character's class and your opponent's character class favours you.

May initiate combat with any opponent from the other faction who has consented to combat.

May use available attacks, spells, and special abilities (buffs).

May increase your character's statistics and potential damage by using any of the weapons and armour available to players from your class at your level.

May read your opponents' talents and gear from their behaviour and visual appearance.

May communicate with your opponent from the other faction using only set animations, sounds, and phrases (within the game client).

Might attempt to 'silence' your opponent by making their more powerful attacks unavailable to them.

Might 'hold the floor' in combat by using your more powerful attacks against your opponent.

Might install interface add-ons that generate additional visual representations of your opponent's statistics and the numerical state of the combat game.

Mediated artefact. Your win is recorded as an additional honour point.

Table 4: The rules of Player versus Player (1vs1) combat in World of Warcraft

The 'solutions' to the problems of winning in PvP combat are the strategies which allow a player to 'hold the floor' by determining spatial relationships and by silencing the opponent, using the strategies by which Johan defeated the warlock in the example above.

These winning strategies are not represented in the game software's interface. Instead, these must be discovered through trial and error by the player, who tries to master the underlying algorithm for combat (Manovich, 2001:222). In this way, the

combat game is structured similarly to drill-and-practice software, which hides the correct answers, and to the search engine, which provides no suggestions regarding how a good query might be assembled. Finally, the default value of this combat game accords a win to a higher level player, or to certain unbalanced combinations of classes.

The meanings of combat

When first Johan talked to me about the PvP video diary that he had recorded, he emphasised the analytical dimension of what he was doing by sneaking around the capital city and killing the warlock. He spoke like the 'power gamers' studied by Taylor (2006) who valued the pleasures of 'instrumental and (hyper) rationalized play'. He explained to me that he had just achieved a full set of new armour, which allowed him to try a new talent build, concentrated in assassination and stealth, so that, with this combination of gear and talents he could sneak around Stormwind undetected for the first time in six months. In other words, he wanted to probe the hidden formula of how the new talent build changed the nature of gameplay for him.

When I talked to Johan about the video a few months later, he discussed the experience in far less cerebral terms. He told me how it had been a 'rush' for him to meet this particular PvP challenge, to be able to enter an enemy capital, kill an enemy player in the middle of a crowd and then swiftly and silently vanish back into the shadows. To Johan, this adrenaline rush of victory in the face of overwhelming odds was what it really meant to be a skilled rogue player. At the same time, the lonely experience of PvP in Stormwind on his own reminded him of other, more companionable 'ganking expeditions' with his guild. It is important to remember that video diaries, written annotations and other elicited comments about recorded gameplay or software use are themselves representations of players' experience, where the player responds to the perceived interests of the researcher, while also representing themselves to the researcher. While earlier it had been important to Johan to explain the highly rational and numerical reasoning involved in success at PvP at this level, at a later date we chatted less formally, and he now emphasised how and why he had enjoyed the experience, although he also remembered that the experience was tinged with melancholy. Semiotic methods would aim to address and acknowledge the multiple layers of subjectivity at play in such experiences, and to embrace them in the analysis, rather than trying to reduce the experience to a single, 'objective' interpretation or label.

For Johan, the experience of sneaking around Stormwind also brought back memories of other visits of sowing mayhem in the Alliance capital with his former guildmates. Johan, Wodahs and other members of The Girl Guides had achieved a certain notoriety among the opposing faction for such 'ganking'³⁵ expeditions, both in capital cities, and in the area where raiding guilds would congregate on their way to the Molten Core instanced dungeons. Johan did not like me to call such PvP expeditions 'gankings' though, since he associated the term with 'griefing' behaviour, or cowardly attacks on low level players. According to Johan, the Girl Guides were not popular and were accused of being 'gankers' precisely because of other players' sour grapes. In this account, other players complained about ganking because they resented that The Girl Guildes often won the fights, despite the odds being stacked against them.

Nonetheless, certain members of The Girl Guides were particularly infamous, and were hated by the opposite faction for their attacks on Alliance capitals. Even Johan was awed by the cold-blooded efficiency of two particular members of the guild, whom he described as 'brutal' and 'so synched [synchronised] it's scary'.

Johan's attack on the warlock was inspired at least in part by nostalgia. In particular, he told me that the visit to Stormwind had reminded him of sneaking into the capital with Wodahs (they were both at level 59 at that stage). In an alleyway, witnessed by an audience of perhaps a dozen other players, they had killed a level 60 player character (then the highest level in the game) who had been newly promoted to 'Grand Marshall' (his PvP rank). The Grand Marshall had been 'leisurely trotting around on his panther' and showing off his full armour, weapons and new title when he was surprised by their attack. Wodahs and Johan won despite the odds, and to them, this success was a benchmark of their PvP prowess. At that stage, the Alliance heavily outnumbered the Horde, and most Alliance players also had access to better gear; for this reason, their win against the Grand Marshall had been particularly significant. In the terms suggested by this paper, Johan and Wodahs exercised representational power over their high ranking opponent, thus 'owning' him or gaining status from defeating a player of higher rank.

³⁵ The term 'ganking' is a contraction of 'gang killing', and in World of Warcraft it is player jargon for an unfair killing, particularly one where a low level player is attacked by a much higher level one, or where one player is attacked by a 'gang'.

A related set of meanings are also expressed in Johan's arrangement of his interface. The screenshot of the attack on the warlock (Figure 3) reveals the way in which he has customised his game interface. In his annotations of the video, he explained that he had redesigned it so that he would be able to display the 'damage' he caused during combat in a central position. In social semiotic terms, it is particularly significant that the amount of damage Johan could inflict on his opponent is placed centrally and in a highly salient typeface and colour in his redesigned screen (rather than being moved to the side with the other floating combat text). Johan explained his design by using a particularly telling piece of World of Warcraft jargon: His prominent display of the damage (in the design of the interface, and in this particular screenshot) was 'pure E-peen'.

'E-peen' (or 'e-penis') is a player term for in-game prowess, reputation and masculinity. The yellow numbers representing damage are particularly significant to Johan since they sum up his effectiveness in PvP – with these numbers he literally rewrites, or alters, the representation of another player. The numbers also represent Johan and his power to the opponent as they are displayed in the opponent's interface as well. Johan's wry but nonetheless serious choice of the 'E-peen' metaphor suggests that prowess in combat in this game is closely related to his masculine identity.

The masculine meanings of this number to Johan makes an interesting contrast with the fact that his character, Blades, is a female character. Johan and several of his friends played female characters in the game. This allowed for certain kinds of identity play within the guild's 'banter', but was also a calculated way of gaining advantages in dominating PvP combat. Johan explained that the small size of the female character made it harder for opponents to target Blades in PvP, and similarly, the pleasure of victory was more intense when his opponent was suitably humiliated by being defeated by a female character.

Bad boys and Girl Guides

Johan's comment about the importance of representing his masculinity and prowess through PvP interaction suggests the importance of gender in the meaning of PvP combat. Here Johan was not alone. The assertion of masculine identity plays a central role in the gaming culture associated with the PvP playstyle. The Girl Guides, despite the parody of feminine propriety in their guild name, cultivated an identity as the 'bad boys' of Argent Dawn.

Formal PvP ranks were not the only criteria for admission to the guild: successful applicants also needed to have built up a certain reputation among PvP players. These reputations were earned by playing together with a group of players who were all working through the game's PvP Honor system. (This is known as 'grinding', because progress in the Honor system required repeated battles in battlegrounds and the Arena). The shared experience meant that players developed a mutual respect and belonged to a 'clique' that had done the grinds together irrespective of whether they played Alliance or Horde.

As Johan explained, to be invited to join his guild, players needed to 'be known/infamous'. Players were accepted into the guild by decision of the guild leader, in consultation with the officers (Johan was an officer). For example, a competent player had asked to join the guild, and had been refused, primarily because he was not already considered a member of the clique – he did not 'know' people. Even good PvPers were turned down – formal ranks as allocated by the game mechanics were not considered sufficient – as Johan explained, 'it was about attitude and the 'tag' you carried'. According to Johan, Desarae, the guild leader enjoyed leading a guild which carried 'the bad boy tag'. By this he was referring to the reputation and infamy that came along with the somewhat disreputable actions of 'ganking' players of the opposing faction, and 'trolling' the game channels and the Blizzard forums.

In World of Warcraft, guilds have a dedicated chat channel, and specific guilds develop their own idiosyncratic conventions and practices in their communication, depending on the preferences of that particular group of players. The Girl Guides players regularly insulted and flamed one another in this channel. The flames and insults between the players were meant in jest, a parodic gesture or a play at insults which confirmed their close relationships. Johan and Wodahs agreed that the overall style of discourse in the The Girl Guides guild chat was certainly in transgression of the Blizzard Terms of Use agreement (which forbids any form of 'offensive' language) but that it was not intended to hurt anyone. He emphasised the contextual, situated meanings of the 'banter' that characterised The Girl Guides guild chat:

Johan: the difference between banter and actual insults is very slim.... we had a lot of that kind of banter, verging on direct insults.... banter is insults you dont really mean, wouldn't you say?

The style of 'banter' in The Girl Guides in many cases focused on attacks on the masculinity of the guild members – players' supposedly deviant sexual preferences were a common target, and so were the players who preferred 'easy mode' character builds in World of Warcraft. For example, players who chose not to play the more 'masculine' melee classes of warrior and rogue, and chose to play easier casters and particularly warlocks and shadowpriests received particular mockery.

Conclusion

This chapter has suggested an approach to analysing gameplay which acknowledges the interactive and discursive structures of games. Rather than being purely mathematical abstractions, games are deeply embedded in an ongoing flow of discourse, and gain meaning in relation to the specific social relations that characterise the context of play.

By exploring the meanings of a short recording of PvP in-game video it has been possible to develop some starting points for multimodal analyses of gameplay, which recognises that players' interactions have proxemic meanings, because they are competing in a rule-governed simulation of three-dimensional space. Players are also vying within a high-speed multi-track conversation, where they aim to dominate the floor and silence their opponents, and thus borrow power and status from them. While multimodal meanings are highly significant, very little of this analysis would have been possible by attending only to the video and audio of the recording. In Geertz's terms, The 'unphotographable' ([1973] 1994:228) dimensions of the event are not captured, and could only be elicited through Johan's comments and recollections, and through my own sign-making processes as participant observer who had access to contextual information about The Girl Guides.

It is noticeable that The Girl Guides' gaming interactions centre on the game channel. Players used an additional voice interface (Ventrilo) to improve their efficiency in team-based play, but they did not use an external website to organise their activities. There are strong connections between the guild's playstyle, and the mediated artefacts created by the game system, which rewards, represents, and motivates their experiences through a range of ludic systems. These include the seasonal availability of new in-game armour and weapons as rewards for PvP combat, the display of PvP titles, and publication of team standings in the Arena.

The notion of 'community' is somewhat idealised in the current literature on the social aspects of gaming, possibly in order to counter negative stereotypes of the isolated

individual gamer, addicted to an all-consuming mediated experience. Games are seen to be able to compensate in some ways in contemporary society by providing new 'third spaces'. Here earlier forms of civic life are seen as somewhat idealised spaces of sharing, or 'vibrant communities, families, and neighborhoods' (Putnam qtd. In Williams, 2006a). This paper argues that such perspectives depict a polity without politics. In particular, they neglect the role of gatekeeping practices, and gender hierarchies, which both play a key role in the guild discussed in this chapter.

According to Sutton-Smith (1997:206-7), social elites tend to associate 'better' forms of play with the fanciful, literature, and the imagination. These approved forms of elite play are set up in opposition to the despised, dangerous, or 'frivolous' play of the other – such as, for example, the violent fantasies associated with popular media and television. Sutton-Smith points out that the distinction serves the hegemonic interests of such dominant groups, who tend to look down on the playful pursuits of subordinate groups, and have historically expressed such disdain through rude disapproval and censorship of overly 'frivolous' play activities, from the gambling of lower classes, to (perhaps most notably for this study) the denigration of women's sports.

Such prejudices have often been used by those who disapprove of computer gaming, and role-playing games such as Dungeons and Dragons. Consequently it is ironic that similar prejudices can be discerned in online games, where player discourse maintains competing hierarchies of play. On the Argent Dawn role-playing server and its web-based forums, players develop a fine sense of discrimination between different styles of play. They often identify 'other' styles of play and discuss them disparagingly in terms that derive from dominant social ideologies. This chapter has documented how the dedicated PvP players in The Girl Guides aimed for a certain efficient style of PvP play, which to them was associated with a masculine identity in the game. From the perspective of these players, other styles are commonly labelled 'noob'³⁶ or 'gay'.

In contrast to this group, the role-players on Argent Dawn can assume the snobbish stance of a literate social elite, and often label the visually focused semiotic practices of non-role-players as illiterate, crude and childish; branding other players dismissively as 'sloppy' in their communication, or as juvenile 'leet kids' and 'lolbois'. It is interesting that, despite being diametrically opposed in their interests, both groups

³⁶ A 'noob' is a newbie or new player.

use similar gatekeeping practices to maintain their internal hierarchies, and to identity and keep unwanted 'others' out. Even more interesting is the way that two members of my guild were able to embrace both styles of play, and how they switched from one modality system and method of interaction to another, depending on the company they kept. This flexibility in playstyle and code-switching in styles of multimodal discourse raises questions about the categorisation of players, either by Blizzard Entertainment, the playerbase, and also by games researchers. The particular semiotic practices of a role-playing guild are discussed further in the next chapter.

University of Cape Town

Chapter 7: Weaving the text:

The meaning of the channel

Yesterday I met the priest, Takal'jin. I had just set up camp near Sen' Jin and walked down the dust road towards the sea, turning left into the little village. I wanted to meet the villagers and so made my fire at the water hole. Takal'jin sat in the only patch of shade, carving some grisly ornament. I attempted small talk, but a few minutes of it were enough for me to resolve to steer a wide path around him in future. Like others of his sort, he displays the accoutrements of his trade with a studied casualness. I saw bones, skulls and all the other gruesome accessories of one who feeds on the fear of those around him. He is a young troll, and personable enough in appearance, but his foul words and sour, insulting manner stripped me of all my intended politeness. After the meeting I was left with a hundred unspoken and angry retorts burning in my throat. His betrothed, the warrior woman Jinth'iya, joined us after a while. She is a formidable looking creature, despite her broken tusks. Unlike other women in the village, she has the confidence to tease Takal'jin, but when she glances away into the distance, she has the look of someone haunted,

Wherever Takal'jin goes, his slight frame casts a long, cold shadow over the village. At the water hole this morning, the village women responded to my queries about him with a glaze of incomprehension on their faces as they cleaned the fish from the morning's catch. They shook their heads at me, pretending they did not understand. I am a foreigner, asking foreign questions. I should stop, pack up my rough little camp and leave their village. I can tell I will never be allowed to be at home here. Shifting uncomfortably away from me, the women glanced up beyond the graveyard, to the canvas-covered hut in the tree at the foot of the hill. The sewn-up eyes of Takal'jin's wards swivelled about and looked back at us from atop their posts. The women scuttled back to their fishing, down on Darkspear Strand (Field notes, posted to guild website).

Takal'jin's hut is in Sen'Jin Village, in the Horde starting area of Durotar on the Argent Dawn server of Blizzard Entertainment's World of Warcraft.³⁷ I know exactly what the hut looks like from the outside. I will never forget how the smell of snakes hits you when you walk into the entrance, or how they slither across the floor of the hovel when you take that first tentative step inside. Even today, if for some reason I end up in that area of Sen'Jin, I still shiver.

Of course, there is no little hovel on the hill behind the graveyard in Sen'Jin Village. World of Warcraft does not allow players to make changes to the game world, other than by levelling up their own characters. Takal'jin's player, and his friend, who played the warrior Jinth'iyia, wrote a description of the house, and posted it on the guild website of The Tribe, the troll role-playing guild in which both of the players were officers, and in which my character, Zarah, was a low-ranking member.³⁸ Together these two had constructed their own imaginary 'Heart of Darkness'. They dreamed up a joint story of voodoo, demons, and loa, played it out in the game, and published illustrated episodes on the website for their guild-mates to read. This is what they wrote about Takal'jin's hut:

Apart from the rest of the bustling village, on a gnarled old tree trunk, stands a hut. Or, hut is a bit strong. It's a ramshackle, weatherbeaten old hovel at best, made out of wooden poles, canvas and old, patched-together pieces of skin, some of them of rather disconcerting shape and color. It seems to be in a sort of permanent state of collapsing, held up by pure stubbornness rather than any force of nature. In front of it are several heads in various stages of preservation, some of which turn in the direction of the onlooker, staring with empty, sewn-up eyes. Bones of various origin and configuration hang dangling from the branches of the tree, aside more mundane items like bushels

³⁷ The name of the guild and characters' names have been changed to protect players' identities. For the same reason, URLs are not provided for articles from the guild website and these sources are treated as personal communication in the referencing of sources for this chapter.

³⁸ This is not my character's real name. Although I wanted to use her actual name in this account, guild members responded to earlier versions of this chapter with the observation that her name could be used to 'Google' the website, which they preferred to keep private.

of dried silverleaf and suchlike. A pervading smell of snake can be felt almost more than smelled, and a more or less perpetual hissing can be heard. There is a powerful sense of dark magic about the place, an old magic stinking of sacrifice and oaths. (Post to The Tribe guild website).

Although Takal'jin's hut was built only of words, my memories of it are very real. These artefacts of the imagination are as socially real to role-players as the 'Honor Points' gained in combat are to the PvP players discussed in the previous chapter. Everyone in The Tribe knows where the hut stands, how to stoop as they enter it, and, more importantly, exactly why they should avoid going there if at all possible. The PvPers' efforts are rewarded with grand military titles (such as 'High Warlord') and Arena standings, because their game play generates lasting artefacts, recorded by the system. As far as the game system itself is concerned, the role-players' stories do not exist.

To the role-players in The Tribe, gameplay was just one part of a collaborative media production process. In this process, players made up for the deficiencies of the game as a channel for communication, by 'channel switching' just as multilinguals are able to 'codeswitch'. Just as multilinguals select from their available languages according to their needs and creative intent, these role-players were adept at customising the channel, semiotic mode, interpretive frame and audience for their communication. Despite the considerable range of communicative options available in World of Warcraft, role-players find them lacking in particular dimensions, particularly for recording their prized visual and verbal narratives, and for asynchronous contact with guild members when they are not playing the game or when their subscriptions to the game have expired. For these purposes, they created their own guild website, where they could plan events, and socialise or share and record their narrative achievements.

Configuring the channel

Multi-user media allow their users to participate in customising the channel and the audience for their discourse. The Web or a game like World of Warcraft can be seen as a channel for communication to specific audiences – those who have access to the Internet in the case of Web users and those who have network access, and have also bought the game and paid their subscription fees to Blizzard Entertainment in the case of World of Warcraft players. On the Web, and in the game, other, smaller

channels can be created which restrict messages to particular subsections of these potential audiences.

When analysing the power relations and patterns of mediation in proprietary software, it becomes difficult to maintain the notion of 'contact' between addressee and addresser via a 'channel' (Jakobson, [1960] 1986:50). According to Jakobson's model of communication, the 'physical channel' is something separate from an 'addressee', or a 'code' (which is not a code at all, but rather a language or cultural knowledge of a semiotic mode). As explained above, in software, at the file level, channels are encoded with the identity of the participants, and their writing-rights in the channel. This chapter uses the channel-switching activities of The Tribe to illustrate the way in which networked media use involves the simultaneous use of multiple encoded channels, each with their own relations of identity and ownership.

In World of Warcraft, a channel is a list of participants, or addressees who all receive copies of the messages sent to that channel. The channel can be a closed list (where an administrator or officer has the power to approve or remove participants), or an open list (where anyone can join). Through sharing messages and online experiences, these participants experience a sense of virtual closeness. Thus channels are similar to spatial arrangements in physical interactions, in that they have proxemic meanings, and the particular combination of channels to which a player has access configures a unique system of social perspective.

'Channel switching' takes place as players shift from channel to channel, and from game, to website, and back again as they enact, adapt and narrate their gaming experience. This switching is a characteristic practice, which is beginning to be termed a 'new literacy', or a 'skill' that should be addressed in contemporary media education. Jenkins (2006), for example, calls this 'transmedia navigation', one of a set of 'new skills' such as 'multi-tasking', 'appropriation', 'distributed cognition', 'collective intelligence', and 'networking'. From this perspective, channel and mode switching are abilities belonging to certain adept persons, and others, who have less experience of these participatory media, are lamentably deficient in them.

Multilingual children are not always able to use their languages in monoglot school contexts. In the same way, players have to turn to other channels and tools in order to overcome the limitations of the game channel. World of Warcraft disallows certain types and modes of communication, and its subscription model places limitations on available audiences. The children discussed in Chapters 4 and 5 had particular

difficulties funnelling their own knowledge and multimodal communicative repertoire into the highly restrictive input modes made available to them by educational software. Unlike these children, the World of Warcraft players had access to a range of more expressive channels. They used their digital media production skills to build their own spaces on the Web, where they became the co-owners (with the free web hosting service) of their guild website. This gave them a channel of their own. Here they could publish their fan work, including verbal descriptions (such as Takal'jin's hut), artwork, narratives, backstories, screenshots, and logs of in-game and Instant Messenger (IM) discussions. They could also display their experiences and achievements to a wider audience than would have been possible in the game.

As Jenkins (2006) points out, a new participatory knowledge culture is evolving in the 'affinity spaces' of popular culture as forms of media converge:

The emergence of these knowledge cultures partially reflects the demands these texts [from popular culture] place on consumers (the complexity of transmedia entertainment, for example), but they also reflect the demands consumers place on media (the hunger for complexity, the need for community, the desire to rewrite core stories) (Jenkins, 2006:259).

This chapter uses discourse analysis to better understand some of the characteristic semiotic practices by which role-playing gamers worked together, inside and outside World of Warcraft, to create, negotiate, and maintain the illusion of their fictional world. On the surface, this appears to be a story of creativity and collaboration. Looking more closely, however, it is apparent that in the process of weaving together their joint collaborative narratives, the role-players of The Tribe wove another text, through which they signified the proxemics of their community, and its relations of inclusion and exclusion. The analysis below suggests that, in mediated discourse, the choice of a channel of communication is as important as the choice of a language in spoken conversation.

Channels and audiences

Players use the various channels in the game to select and customise an audience. Players can use pre-existing channels to choose which audience they wish to address, they can also create custom channels, both in and out of the game. These allow them to establish relations of intimacy, surveillance and hierarchy, and to signify

distinct identities and topics of conversation. It can also function to exclude certain players from events, and even from the knowledge that anything is happening.

Effectively the game allows two systems of proxemics – spatial and social, and these two systems determine social proximity in the guilds and groups to which the player has been invited and the channels they use to communicate.

Social and spatial proxemics in channels

In World of Warcraft, players communicate verbally with other players by typing text and special commands, known as ‘emotes’ into a ‘chat box’. They prefix the text with a channel command, which determines who will see the text they type.

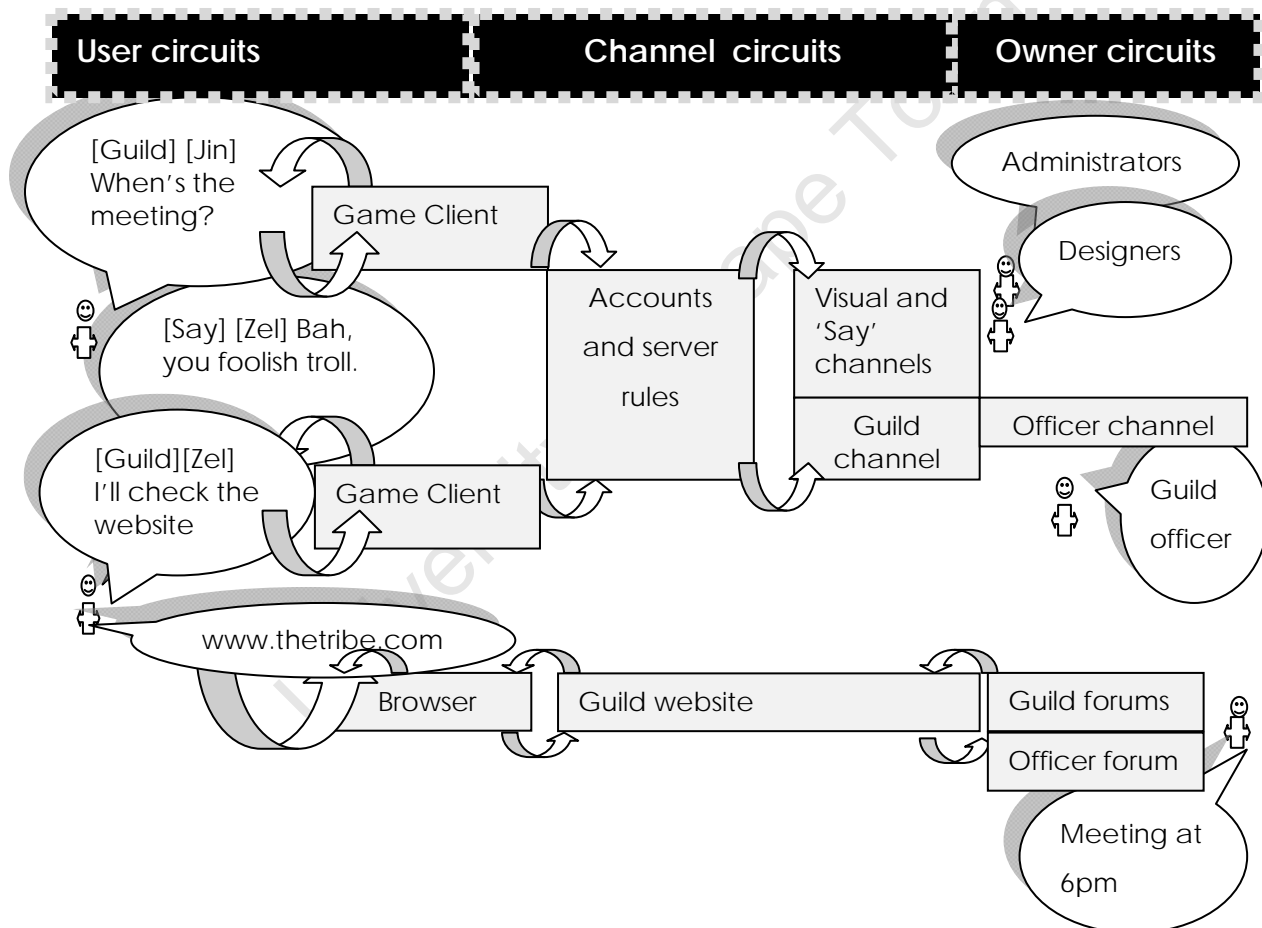


Figure 1: Simplified production-reception circuits for World of Warcraft dialogue

The default communication channel in the game is the ‘say’ channel, which is rendered as a speech-bubble in the visual channel of all players within a certain radius in the game’s simulated space. On role-playing realms, the ‘say’ channel has a particular meaning. As will be explained below, this channel is reserved for ‘in character’ speech, where players pretend to be speaking as their game characters.

The circuit diagram in Figure 1 depicts a typical channel-switching interaction. While guild-mates are role-playing 'in character' and communicating verbally in the game's 'say' channel, they can also be conversing as themselves, or 'out of character' in the guild channel. In this case, they are discussing the time of a guild meeting. In the guild channel, the guild officers are still in a relation of clientship to Blizzard Entertainment, but are granted limited 'writing-rights'.

Outside the game client, the players are using the guild website. In this case they are checking a message about a planned guild meeting, but they could also be posting a humorous message, reading other player's character backstories, or consulting other narratives, such as summaries of the history of Azeroth, or the description of Takal'jin's hut. On the guild website, the officers are the co-owners of the channel, with the free (advertising supported) web hosting service.

The 'say' channel is only visible to players whose characters are in close proximity to the speaking character in the simulated game space. Thus the sudden spatial transitions which were discussed in Chapter 6 also influence the game's simulation of speech. Takal'jin's hut may not be visible (as indicated in Figure 2), but he nonetheless used game mechanics to create a more private space for himself. Because of the abrupt proxemics of the game, when characters move into the hut space, their speech and emotes in the 'say' channel are shielded from others who are in the general area, but who are not standing right 'in' the hut.

The 'say' channel also appears in the chat log, where it is logged with the other game channels in use by the player. The player may also receive 'whispers' or 'tells', which are private and conveyed directly to a particular addressee. Group chat copies a message to a small group of players who have temporarily banded together, usually for some questing activity, and guild chat is broadcast to all players who have been invited to a particular guild.

Finally, the standard and custom channels on a realm allow players to speak to any other players from the same faction. A different set of proxemic meanings and mores are associated with each of these channels.



Figure 2: Visiting Takal'jin's 'hut'

The power of the channel

Choosing a channel can signify a specific identity for the speaker, and establishes the relationships of interactive and represented participants in specific ways. In this it has similar functions to the choice of a language. Players switch channels for a number of reasons, and a switch may happen for reasons of politeness, or because they need to access a specific mode, as well as for reasons of secrecy. Yet there is a significant difference here. When people speak a different language to exclude someone, that person is aware of being excluded. When channels are switched, those who are excluded by the switch are unaware that they are being excluded.

Invisible channels are highly significant in online media. In convergence culture, access rules are the functional equivalent of organizational structures (Zuboff, 1988:357), and this means that power can be hidden. Online researchers need to acknowledge what relationships are constructed by these rules of inclusion and exclusion in the virtual sites that they study. In this chapter, I analyse the multimodal discourse from two role-played events organised by The Tribe. From this perspective, it is highly significant that, for the first few months in which I played on Argent Dawn, I was not aware that plot-based role-playing was happening in the Horde guilds on the server. The role-playing guilds that I did find were short-lived associations of players

that usually dissolved within a few weeks of being founded. These players were relatively inexperienced, and although projects were planned with great enthusiasm, the groups displayed little ability to achieve the kind of organisation needed to collaborate on anything much beyond questing and levelling up their characters. Consequently both the guilds and their membership disappeared without any warning, and displayed the high rate of 'churn' identified by Williams *et al.* (2006) in their quantitative analysis of guild data from World of Warcraft.

After encountering some players from The Tribe for the first time, it took me more than a month to be accepted to the guild. This was partly because the leadership of the guild had just changed, but it was also because the guild's exclusivity was a distinct part of their identity. The Tribe did not recruit actively, instead, as was the practice in the 'elite' raiding guilds on the server, players had to apply to join The Tribe. Before they were admitted, their writing, role-playing, and knowledge of the Blizzard backstory (or, in player terms, 'the lore' or narrative of Azeroth) was subjected to careful scrutiny. Even after I had been accepted, I was often worried about the possibility of losing my membership, as the officers required active and weekly participation. An absence from guild activities for more than three weeks was a reason for expulsion. The policy was summarised succinctly at a guild meeting by an officer: 'RP or gtfo [Role-play or Get the fuck out]'.

Roleplaying in World of Warcraft

Unlike other fan communities, where fan work creates new stories, websites, artwork and even music, roleplaying gamers are able to do a great deal of their creative embellishment within the medium of the game itself, although they also utilise external fan media.

Role-players aim to entertain one another through improvised dramatic encounters. These encounters take place between player characters within the overarching generic constraints of the narrative fiction associated with the Warcraft stories (often referred to as the Blizzard 'lore'). These stories were developed through the series of best-selling real time strategy games and continued in the World of Warcraft MMORPG, but they are also extended in game novelisations and a tabletop role-playing game.

Communication skills, imagination and knowledge of the 'lore' are highly valued in the role-playing community. As Burn (2006) explains, role-playing games resemble traditional oral narratives in the following way:

The dynamic of the texts is to see how improvisatory flair on the part of the poet can stitch together and adapt the formulae, and in the case of games, how the player can stitch together the given repertoires into the sequence that will gain the desired goal (Burn, 2006:77).

Burn's explanation focuses on single-player role-playing, but the challenges of collaborative improvisation in multi-player environments present players with several other challenges. This chapter discusses how players collaborate as they use representational and ludic semiotic systems and how these emerge in inter-player collaboration and conflict.

Role-playing servers

In their discussion of role-playing on an Anarchy Online server, Burn and Carr noted how players slip in and out of role, speaking by turns as their character (or 'in character') or as players engaging in sociable chat or addressing the practicalities of forming teams ('out of character') (Burn and Carr, 2003:20). In the World of Warcraft role-playing servers, these two forms of player discourse are carefully regulated and separated. Special rules for the role-playing server determine where players may speak 'out of character' and where they must speak 'in character'. The key rules are the following:

Absolutely no out of character (OOC) or Non-Fantasy related dialogue should take place in the /Say, /Yell, or Party Chat Channels.

Guild Chat will not be policed for any fantasy related violations (World of Warcraft Europe, nd).

Thus the Blizzard rules regulate the fictional framing of discourse in certain channels on these servers, although, as players often complain, the rules are not strictly enforced, and these few rules are the only concession made by Blizzard to the different playstyle on these servers. Role-players form a minority player sub-culture within World of Warcraft and these players (probably rightly so) consider themselves neglected and somewhat short-changed by the Blizzard developers.

Gender, narrative and devalued playstyles

Role-players' interests are not accorded much importance by Blizzard, the game developers. On World of Warcraft 'elite' players belong to raiding guilds (which have been estimated as 3.6% of the player community) who are able to access the best

rewards. These vocal, 'hard-core' players receive a great deal of attention from the game developers, who are aware that this group is likely to be influential among the broader playerbase (Ducheneaut *et al.*, 2006). As Ducheneaut *et al.* suggest, this means that the developers spend a disproportionate amount on content intended for a tiny, though influential minority of players. Consequently, roleplayers have often demanded a 'role-playing patch' (a patch is the name for a downloadable new addition to an existing game) which would adapt the game to better suit their playstyle, much as the Arena adapted it to suit the PvP playstyle discussed in the previous chapter.³⁹

The neglect of narrative playstyles by the game developers has a gendered dimension, although it affects both male and female role-players. Women's (and men's) gaming preferences are not determined by their sex, but are shaped by the peer culture in which they participated as children, and the gaming experiences to which they are given access (Carr, 2005). Many female players (like Desarae, the guild leader of The Girl Guides) are power gamers who have little interest in role-playing, and I met many male players who are avid role-players. Nonetheless, as the accusations of roleplayers being 'nub' and 'gay' suggest, the activity as a whole may be 'tainted' with associations of femininity. As Laurel found in her study of 1100 U.S. children, and a survey of 10 000 questionnaires, narrative plays a particularly

³⁹ In a discussion thread posted to Blizzard's EU Role-playing forum between 16 October 2006 and 14 August 2007, players were asked by a Blizzard games master what single feature they would like to see implemented in a 'patch' for the role-playing community. Players posted nineteen pages of suggestions to the forum. The most popular feature requested by players had nothing to do with software, but related to community management on the role-playing realms – players suggested that Blizzard's Games Masters should be stricter in their enforcement of the role-playing policies on these realms, or should discourage non-role-players from creating characters on the role-playing realms.

The most popular software feature requested by players was the ability for characters to be able to communicate across faction boundaries. As explained above, players whose characters belong to the Horde faction are not able to communicate with players whose characters belong to the Alliance faction and vice versa. With these coded limitations, inter-faction communication is limited to a small set of stock emotes and animations. The role-players who posted to the thread were almost unanimous in explaining that they needed this ability in order to improve the realism and suspense of their role-playing plots.

important role in young girls' playground cultures (1999). Narrative reworking and fan fiction by adult women are mainstays of television fan cultures (Jenkins, 1992). It is also possible that the character-based identity play associated with massively multiplayer online games (MMOGs) in general may help to explain the fact on MMOGs are relatively popular among women, with about 20-30% female players (Taylor, 2006:24).

Williams *et al.* (2006) link role-playing servers to some intriguing questions about gender. They note that gender, romance, and flirting play a more important role on the role-playing servers than on other servers. They also report that players equate the social difficulties specific to a role-playing server with a misalignment of gender among role-players, claiming that on role-playing servers, female players are 'very aggressive' while there is a shortage of suitably masculine 'alpha male' players (2006:356-7).⁴⁰ Given the association between narrative play and women's entertainment, the prejudices suggested by the player's judgement is a reminder of Sutton-Smith's point that women's and girls' games are traditionally devalued (1997:206-7) - hence the assumption that male role-players would be somehow deficient in masculinity. It is simultaneously a reminder of the traditional distrust of women who intrude on male domains and 'play with power'. Possibly, from the perspective of the Blizzard developers and certain sectors of their playerbase, some modes of play are viewed as more or less desirable precisely because they are considered indexical markers of specific social identities.

In the games industry as a whole, design and development methodologies often focus on making the kinds of games that the designers themselves would like to play, and on playtesting them with small numbers of existing fans who are often from a similar social background to the developers (Taylor, 2006:123). These tendencies have almost certainly led Blizzard Entertainment's game developers to ignore ways in which they could support narrative play, which, given the narrative limitations of computers, would involve paying attention to players and their ability to shape narrative activities, rather than simply building another quasi-semiotic number-crunching system by which to rank players.

⁴⁰ It is unclear whether the women are considered excessively masculine by comparison with women from the general population and whether male role-players are considered deficient in their masculinity by comparison with male players from other World of Warcraft servers.

What the channel signifies

Computer Mediated Communication (CMC) allows communication where spatiality, proximity and synchronicity are reduced in their importance. Spatiality becomes abstract. Games allow players to choose a simulated version of spatial relations where they can only talk to those near to them in the simulated space, while simultaneously they can choose to construct their own social spaces in the form of guilds, parties, raids, and other non-spatially bound conversations. The combination of these spaces gives each player what amounts to a unique social system of perspective. Players from The Tribe were adept at manipulating these semiotic systems. A multimodal discourse analysis shows that they used game channels, and in particular the guild channel to establish the proxemic character of their interactions and to manage, applaud and comment on their own collaborative dramatic improvisations.

Role-playing and framing

Role-playing shifts the meaning of game events, so that a player's lines of chat in the 'say' channel are interpreted as their report of the speech or the narrated actions of their characters. For example, the sequence below is an extract of the chat log of my character Zarah's first meeting with Takal'jin.

Takal'jin peers at you searchingly.
Zarah nods at the troll at the waterhole.
Takal'jin's sole attention is focused on some small bone he's carving.
[Zarah]: Anyone mind if I make my supper here?
Zarah addresses the group at large.
[Takal'jin]: Hmm? Bah ... Do what you will...
Zarah tosses her red braids back defiantly.
Takal'jin mutters sourly.
[Zarah]: Thank you kindly.
Zarah's tone belies her words.
Takal'jin returns his attention to the carving. It looks to be some sort of humanoid vertebrae.

In this short exchange, Takal'jin and I use a range of narrative resources. First, the channel in which a statement is typed changes the identity of the speaker. Typing a statement in the 'say' channel is the equivalent of a pronoun shift.

Zarah: Anyone mind if I make my supper here?

In Zarah's comment, the channel means that the 'I' (typed by myself, the player) in fact means 'she' (Zarah, the fictional troll character)

Players also use pre-scripted game 'emotes' which trigger animations and sound clips, or take advantage of the ability to select another player as the object of the emote.

Takal'jin peers at you searchingly.

Role-players also use 'free-form emotes', where the only limitation on the narration is that the character name is coded to be the subject of the sentence, a convention which identifies the source of the narration.

Takal'jin returns his attention to the carving. It looks to be some sort of humanoid vertebrae.

A more detailed discussion of the characteristics of this form of discourse follows further below.

Fine (1983) explains how players move between three interpretive frames which position them as persons, as players in a game, and as characters in a story. The 'frame' here is a spatial metaphor from Goffman (1974) which describes how people assume, use, and shape the conventions and relationships that guide action and interpretation in a particular situation. Framing has also been used as an explanatory category for play. As Bateson points out, play is a represented interaction. Play occurs in mammalian species when the participant organisms can use 'metacommunication', or frame their interaction with signs and signals which carry the message 'this is play': 'The playful nip denotes the bite, but it does not denote what would be denoted by the bite.' (Bateson, [1954]1985:133). Thus role-playing, like many of the activities in a MMORPG is 'play within a play', or a character frame within the player frame, which is itself only one facet of a person's identity.

In the absence of much attention from the developers, role-players themselves police the rules about 'in character' discourse with all the enthusiasm of the 'language mavens' documented by Cameron (1995) in her discussion of normative attitudes to language. Cameron's 'language mavens' fill newspapers with letters deploring the parlous state of English spelling and grammar, 'warning of linguistic decline'. Similarly,

role-players are noisy and prescriptive language users, who often bemoan discourse features such as leetspeak (which uses numbers instead of letters) and AOLspeak (abbreviated chatroom jargon, such as LOL and emoticons). Players who use this kind of language are labelled 'leet kids' and 'lolbois', and while some role-players take time to explain the rules to players who do not understand or respect them, others enthusiastically report any transgressions of the local rules of 'verbal hygiene'. Transgressors of the server rules can receive formal warnings or be banned from playing (Cameron, 1995:viii).

'In character' role-played discourse is clearly demarcated and specified in World of Warcraft's role-playing realms. The particular nature of the discourse can be compared to the linguistic practice of codeswitching. In codeswitching, bilingual speakers often switch from one language to another in order to express certain meanings apart from the meanings in the words. This is known as 'entextualisation' (Chan, 2004). During role-play the *channel* in which text is typed carries the meaning of a fictional or 'in character' interpretive 'frame' (referred to by players by the abbreviation 'IC'). Codeswitching is a normal part of language use in multilingual contexts, to the extent that researchers have suggested that even the name 'codeswitching' reveals the biases of monoglot researchers. Similarly, shifting fluently between different channels and in and out of character identity is the norm rather than the exception in online game and other online chat environments (see Jones, 2005).

Joining the Tribe

Guilds in World of Warcraft are a representation of community and of the players who belong to them. Players talk about having a guild 'tag', and it is an important and sought-after part of their identity. I detail the process I went through to join the troll guild, which was a drawn-out and painstaking process. In fact, the experience of being considered, evaluated, interviewed and auditioned for the guild was probably more stressful than many job interviews I've attended.

The first step in being admitted to the guild consisted of submitting a character backstory to the guild's website. The backstories were discussed by existing members and guild officers, who evaluated the backstories, commented on the quality of the writing, and gave character references for the players. The most frequent source of problems with backstories were narrative inconsistencies, where the player's story conflicted in some way with the official Blizzard 'lore' or the game backstory. In my

case, despite the fact that I had spent some time preparing and writing a backstory, it was sent back to me for 'correction' before it was accepted.

I was intrigued by the guild, but I found it difficult to write Zarah's backstory according to the Blizzard lore. For one thing, I found Blizzard's characterisation of the trolls offensive, caricatured and ignorant. The designers had 'borrowed' themes, ideas and images from a diverse range of cultures and tacked them together into a depressingly colonial fantasy of 'primitive' life. According to Blizzard, trolls are xenophobic tribal villagers with fake Jamaican accents, 'savage' head-hunters who live in tree-houses, with a blood-thirsty and cannibalistic past. They live in small villages, are pleasure-loving and superstitious, and are depicted with a sensationalised Hollywood version of 'voodoo' as their religion.

I was hoping to play a different kind of troll, and wrote a backstory for Zarah, whom I imagined as a feisty young survivor, suspicious of the way religion was used in troll society. In response to the guild officer's comments, I made some changes to the backstory to bring it closer to the official Blizzard 'lore', but the problems with my character concept plagued all my subsequent experiences in The Tribe. Nonetheless, my backstory was accepted, and I was soon approached in-game by a guild officer for a 'screening chat'. During my screening chat, Takal'jin, who was also a guild officer in The Tribe, clarified the guild's expectations of its members:

[Takal'jin] whispers: we concentrate on two main characteristics in members:

[Takal'jin] whispers: 1: Be a nice person.

[Takal'jin] whispers: 2: Have an interest in RP.

This meant that players who misbehaved, or who were not active role-players, or who didn't play regularly could be expelled from the guild. The officers jokingly referred to this as 'spring cleaning'.

The final step in the admission process was a role-playing audition, which was another somewhat stressful experience. According to the character backstory that I wrote, Zarah was a stranger to the villagers. The tribe members whom I met in Sen' Jin at the audition stayed true to the Blizzard characterisation of trolls as xenophobic towards all outsiders. To convey the flavour of this encounter, I will return to the chat log of Zarah's first meeting with Takal'jin, which I recorded during the audition:

Takal'jin peers at you searchingly.
Zarah nods at the troll at the waterhole.
Takal'jin's sole attention is focused on some small bone he's carving.
[Zarah]: Anyone mind if I make my supper here?
Zarah addresses the group at large.
[Takal'jin]: Hmm? Bah ... Do what you will...
Zarah tosses her red braids back defiantly.
Takal'jin mutters sourly.
[Zarah]: Thank you kindly.
Zarah's tone belies her words.
Takal'jin returns his attention to the carving. It looks to be some sort of humanoid vertebrae.

Notice that, although this sequence followed the 'screening chat' where I met Takal'jin the player, Zarah and Takal'jin are not acquainted in the role-played story, and the characters do not use one another's names. The micro-narratives in the emotes direct players' attention to key imagined details (such as the 'humanoid vertebrae' carved by Takal'jin, or to Zarah's sarcastic tone and defiant attitude).

Like Takal'jin, the other villagers whom I met that evening role-played fluently, using free-form 'emotes' to describe their actions, and to add imagined detail to the narrated scene.

I realised at some point during the audition that, since my character had not grown up with the other villagers (according to my backstory), she would be considered a social outcast, and that she would be known as 'scum' within the tribe. I left the audition somewhat shaken. A few minutes later an officer messaged me to say that I had been accepted into The Tribe.

Guild channels

Once I had been added to the guild, I had access to the specialised guild chat channel, which distributed messages to all guild members, and which could only be read by guild members. I was astonished at how having access to this channel changed my experience of the game. The players whose suspicious and xenophobic characters had spent the past two hours treating the poor Zarah like scum welcomed me effusively to the guild. The style of discourse was entirely different in this channel, as can be seen from the friendly and informal goodnight greetings, smileys and hugs I received when I bowed out, not long afterwards, exhausted:

[Jinth'iya]: Sleep tight Zarah! *huggles*
[Ven'jo]: night ^^
[Rosa]: nighty ^^
[Ven'jo]: i think we found a new scum ^^
[Jinth'iya]: Heheeee
[Zarah]: i heard that
[Jinth'iya]: No you didn't
[Zarah]: *growls*
[Rosa]: *chuckles*
[Taka'jin]: Sleep tight :)

Guild chat messages were displayed in bright green text, and, as this affectionate greeting sequence indicates, it was an unpoliced zone, where players could speak out of character, and could use smileys, abbreviations, and other language of a less formal register than the role-played narrative.

The speed of the interchanges gave the guild chat a markedly high and somewhat intrusive modality. I was somewhat humbled when I realised that the players who had been so intimidatingly fast at typing their emotes during the audition had also been managing to continue this parallel, and equally demanding interaction in their guild channel. The players called the channel GreenSpam™, and saw it as integral to their positive experience of the guild.

At first, having access to the guild channel made me feel like an interloper, a stranger who was awkwardly included in an uncomfortable group hug, but I soon felt lonely without the cascade of smileys, jokes, banter, hugs and bickering.

In addition to the guild chat, the guild had created a custom 'Hotline' channel so that they could communicate with other role-players who were not in the guild, and with guild members when they were logged into the game with their 'alts' or secondary characters. The text in this channel was coloured grey, and so it was lower in modality. It was a less intrusive, but nonetheless noisy addition to my game experience.

Role-played narrative

The players interpreted the 'savage' and 'primitive' themes in the narrative to suggest a strongly patriarchal and hierarchical social organisation, with troll females

accorded a subservient and 'traditional' role in the village. This meant that my character was soon in trouble with the villagers, particularly with Takal'jin, the 'hexxer'.

In the following extract, Zarah ventures out to Takal'jin's hut in order to confront him after he had created a 'voodoo doll' from her hair, and used it to torment and almost drown her.

Once again, the words and actions should not be interpreted as belonging to the players, but to the characters.⁴¹ The role-played speech and emotes are all typed into the 'say' channel and displayed to everyone who has gathered in the general area of Takal'jin's hut. A group of worried villagers are looking on.

1. Zarah reaches over, trying to grab the doll.
2. Takal'jin isn't holding it, so that's tricky.
3. Zarah pushes Takal'jin's hand towards the oil.
4. Takal'jin snarls viciously as his hand is pushed into the boiling fat.
5. Takal'jin clenches and unclenches his hand, skin peeling and bubbling off.
6. Ven'jo rushes to push Zarah to the side away from Takal'jin.
7. Zarah keeps Takal'jin's hand in the fat.
8. [Ven'jo] whispers: just gonna fear you ^^
9. Ven'jo has challenged you to a duel.
10. [Ven'jo's Mind Control spell sends Zarah running in terror around the graveyard and back to the door of the hut]
11. Takal'jin cradles his hand inside his vest, snarling softly.
12. [Zarah uses her spell Feign Death to fall down as if dead]
13. Zarah collapses outside the hut, as a small snake slithers off into the dust.

⁴¹ This sequence is one thread from a multi-threaded interaction. The contributions of a number of other villagers were interlaced with these turns. To clarify the workings of interactive narrative construction, turns which do not cohere directly with the narrative have been edited out of the log. The unedited chatlog in Table 1, Appendix A gives a better sense of the multi-threaded nature of role-played discourse.

Role-played narrative is a collaboratively woven text, and players aim to create a coherent sequence of individually authored events. As in the Hallidayan model of dialogue, these events are constructed in interactive pairs. When players narrate events that involve more than just their own character, they phrase the event as a narrative offer, which other players must then accept, reject, or hedge. This usually takes the form of one player offering a potential cause of an event, and leaving the other player to describe its effect. Deviations from this pattern are seen as highly egotistical, and are labelled 'power-emoting' or 'god-mode' by players.

For example, Zarah tries to grab the voodoo doll (line 1) in the example above. Here I phrased this narration in conversational form, as an 'offer' to grab the doll. Takal'jin the player must accept my offer of this event, and he does not accept it, as his hedging narration in line 2 suggests. He is revising my version of the story, by pointing out that the doll (which he controls) is not visible, and so I cannot reach out to grab for it. The narration allows him to embroider imagined details that are not visible in the visual tableau – he informs me that the voodoo doll is not in reach. At the same time he refuses my narrative offer with a polite hedging move: 'so that's tricky'. I narrate a second narrative offer in line 3 – in this I suggest that Zarah might douse Takal'jin's hand in a large cauldron of boiling fat. In lines 4 and 5 Takal'jin accepts this offer, and everyone participating in the scene accepts that Zarah has attacked the hexxer and plunged his hand in the boiling fat of his cauldron.

Ven'jo reacts by rushing over to save Takal'jin, offering a narrative suggestion that his character might push Zarah aside. I do not respond to his offer, narrating instead that I keep Takal'jin's hand in the cauldron. This decision may have been something of a power-trip on my part, although it is also possible that I did not notice Ven'jo's emote. Such emoted battles can lead to tedious stale-mate situations, and so, at this stage, Ven'jo resorts to offering a duel to resolve the situation.

In line 8 Ven'jo sent me a whispered message (this opens a private channel between two characters which no other characters can see). He explained that he wanted to 'fear' me, or use a spell that would send Zarah running away in fear.⁴² The game combat system reported that he had challenged me to a duel, and all the other players saw the duel flag appearing, I acknowledged his request by accepting the duel, and this meant that he could use his 'mind control' spell to control my character's movements.

⁴² A duel is the way in which players from the same faction can engage in combat.

Ven'jo's mind control spell took Zarah out of my control, and sent her running through the hut and out towards the graveyard and then back to the hut again. Just as everyone treated the missing hut as if it were really there, no-one treated this as a 'real' duel, and the prominent duelling flag was ignored. Instead the mediated action of a single spell was used to dispose of Zarah's threat to Takal'jin, and to characterise Ven'jo, as a 'hexxer', powerful spiritual adept and loyal acolyte to Takal'jin.

At this stage, I felt exhausted, and so 'copped out' of any further drama by using the 'feign death' ability. This ability triggered Zarah's 'die' animation, and she fell down, apparently dead. I then told the other players (via the guild channel) that I needed to take a break. We resumed the narrative later, when it was Takal'jin's turn to take a characteristically horrible revenge on Zarah.

In narratology, the 'dual time-scheme' of narrative involves, on the one hand, the chronological sequence of the fictional events (which are referred to as '*fabula*'), and on the other hand, the succession of signs by which the events are represented (which is referred to as '*sjuzet*') (Rimmon Kenan, 2006). In role-played improvisation, this duality is highly compressed although it is still there. A new fictional event is constructed in every turn in the dialogue. The narrative is woven from the events imagined by all players, both inside and outside the game. In improvised play, this collaboration is managed by giving each player ownership of one thread in the dialogue. While the performatives of PvP gameplay are confirmed as real by the game system, the events of role-played narrative are only treated as 'real' by players once the events have been socially confirmed.

Narration in verbal and visual channels

The role-played scene takes place primarily in the text channel, with the players' visual avatars standing still. The visual scene signifies the setting and the proxemics of the event. In the encounter discussed above, Takal'jin and Zarah are confronting one another 'inside' the imaginary hut. The players accept that the visual representation of the scene does not change, and they foreground and accord a higher modality to the verbal events in the chat channel, where they are free to improvise whatever actions they can imagine, rather than being limited by the set animations provided by Blizzard. In this way, the conversational 'floor' moves to the chat channel and away from the visual scene, which now functions primarily to provide a context for the discourse.

The role-players use individual procedural resources of combat and animation (such as the mind control and feign death spells) to dramatise the situation, to resolve a potentially drawn-out impasse between them, and as a form of punctuation which marks the ending of a role-playing 'episode'. In this case, such procedural resources allow them to resolve the narrative conflict through the use of representational force (a mediated action), the nature of which is understood, and which has already been consensually agreed between the players. The combat game is thus used in very different ways by PvPers and by role-players, as indicated in Table 1, below.

<i>Role-played duel</i>
<p>In order to role-play combat successfully, you:</p> <p>Must narrate at least an invitation to role-played combat in a game channel or an external channel (if you want to invite the opposite faction).</p> <p>Must narrate the causes, not the effects of events that might affect your opponent.</p> <p>Must avoid power emoting or changing your opponent's representation before they have consented to the change.</p> <p>Must make your narration cohere with the narrated events that precede your intended action and the reality of the fictional world as agreed by the players.</p> <p>Must ignore certain game mechanics, such as the duel flag.</p> <p>Along the way, you:</p> <p>Should consider the further narrative consequences of this conflict.</p> <p>May use the default values of any or all of the PvP combat rules, animations, and/or events in order to illustrate your battle, decide its outcome or make it seem more real.</p> <p>May decide to have a winner and loser or some other outcome.</p> <p>Might choose to express your character concept in the way you narrate combat.</p> <p>Perlocutionary act: The outcome of the duel should be decided collaboratively by both opponents, or they should agree to abide by the outcome of a duel as determined by the game mechanics.</p>

Table 1: Role-played duels as a procedural genre.

In-character discourse and interaction

Roleplayers are serious about deepening their 'immersion' in the world created by Blizzard. As Carr explains, immersion is traditionally regarded as a non-critical form of absorption for readers of generic fiction, who use their favourite genres to enter 'a pleasurable trance-like state of immersion' (Carr, 2006:54). The above example of improvisatory role-played discourse suggests how much creative, semiotic and collaborative 'fan work' is required to maintain the illusion of living in a fictional world.

Figure 3 is a screenshot from a video that documents a wedding between Takal'jin and Jinth'iya some months after the voodoo doll episode discussed above.⁴³ Screenshots of the marriage proposal were posted to the website, and the guild spent several months discussing how the wedding would be conducted. It was decided that the ceremony would begin with the male and female trolls gathering separately, in order to initiate the bride and groom to their new roles as a married couple. After that the whole tribe would gather for the actual wedding ceremony, which would take the form of a blessing from the tribe's 'Spiritmaster' or lead shaman, Shak'tilah, and a ritual wrestling match between bride and groom. This was to be an unarmed duel which, in an interesting adaptation of the combat game's mechanics, would be used to establish the dominant partner in the marriage. Figure 3 depicts the first stage of the ceremony, where five female troll characters gather to prepare the prospective bride for her new role as wife.



Figure 3: Female trolls preparing a bride for her wedding.

The scene in Figure 3 above is a composite perspective rendering of objects selected from a vast database of three-dimensional game art. The scene is rendered from a

⁴³ This was an 'in character' wedding – the players themselves were apparently not romantically involved.

simulated 'camera' which moves around with the player. Role-players focus on enhancing the coherence of the representational illusion they create together. This is a cross-modal coherence, and requires attention to the visual scene, verbal dialogue, narrative framework and interactive capabilities of the scene.

Narrative frame

Five female trolls are arranged in a circle on Darkspear Strand, just outside Sen'Jin Village. Sen'Jin Village is the ancestral home of the trolls, and forms a base for many activities of the guild because of this. It is also used because it is a 'low level' area without dangerous monsters, where Horde characters of most levels can move freely. The setting is carefully chosen. Across a placid expanse of water, the jungle vegetation on the Echo Isles can be seen silhouetted against the exaggerated pink sunset. Sound effects include wind whistling across from the nearby desert, the waves lapping on the sand, and an occasional drum-beat from Sen'Jin. These sounds overlay the melancholic strains of strings and horns, which form a martial sound-track for the Horde starting area. For the players in this guild, Sen'Jin village signifies an 'authentic' or 'tribal' troll identity.

Visual coherence

The proximity and attention of the characters in the scene above is emphasised in that they have arranged themselves into a circle, where they all face one another. Here the represented participants are defining a specific social situation within the game. To use Goffman's terms, they have formed 'an ecological huddle' (1965:135). This means that they have oriented towards one another and away from others who might be present in the game space, but are not part of the 'woman talk'. While other forms of game-play emphasise spatial and ludic interactions in the visual channel, role-play often consists of players settling their characters into a semi-static tableau, and then focusing most of their creativity on improvising the scene in verbal language. Establishing the *mise en scène* is similar to any other dramatic production in that it involves choosing the setting, the costumes and props for the characters, and establishing the staging, especially the proxemics of the characters in the represented space.

The speech-bubble is a visual form of direct speech, which shows one player speaking 'in character' as the mystic of the tribe, 'Shakti'la'. This is an automated function which uses the comic-book convention as a cohesive device to interleave the text from the chat window into the three-dimensional scene.

All the players have dressed their characters in carefully chosen 'tribal' outfits, and Shakti'la will later don a 'voodoo mask' for the wedding ceremony. These outfits have little value for questing or PvP combat in the higher levels of the game, but they are used as costumes which cohere thematically with the visual vocabulary of Sen'Jin Village and Blizzard's neo-colonial characterisation of the trolls.

Framing the shot – simulated camera

When recording this event, I framed the shot (with the simulated game 'camera') as a medium distance shot. This emphasises the social meaning of the scene of the female trolls against the sunset, and it is significant that I have chosen this rather than zooming in on the individual characters and their appearance, or taking a bird's eye view of the village from above (as Johan did when in Stormwind).

In game terms, the 'level' of the characters is not visible from this screenshot, and this is another deliberate choice, which reflects the down-playing of ludic elements among the role-playing community. I was using 'ImmersionRP', a user-interface modification designed specifically for role-players, which allows the user to choose to hide the whole user-interface, other than the chat window. The add-on also conceals many of the overtly ludic dimensions of the game scene. The name of the add-on 'Immersion RP' highlights its purpose – to break down the fourth wall presented by the interface, and allow the player to experience the game as if she were the character. While using the add-on, the player can still interact with the three-dimensional scene using keyboard shortcuts, but many of the interactive resources of the game are not on offer.

Narrative customisation

As Mortensen (2006) explains, the overall game narrative in World of Warcraft cannot be customised, and this presents plot-based role-play with particular challenges. The players do not have 'writing-rights' in the channel in which the story is recorded, and so certain changes which they would like to make are simply not possible, as the example of Takal'jin's hut suggests. As Mortensen describes, in World of Warcraft, world events are usually a major game event involving the whole server. In everyday play, however, player actions only act as triggers for scripted elements of the game narrative, which then reset and respawn so that another player or group of players can experience the same story, also as its protagonist. One coded story generates millions of (mutually exclusive) narrations.

Consequently, from the perspective of plots, role-playing in World of Warcraft is often extremely dull – a kind of running commentary which adapts the software's actions into narrative form. This is a world where you cannot kill those you can talk to, and where you cannot really communicate to those that you can kill. Nothing that players do ever really changes their environment. Consequently, the characters and their statistics take on a particular significance because they are the only aspect of the game that can be adapted – only here are players co-owners of the channel. The characters themselves are an automated recording of the game events that have happened to them. Game characters can thus be seen as a numerical and highly nominalised narrative.

This suggests that role-players in World of Warcraft have somewhat limited options in respect of two of the major defining elements of drama: conflict and change. The staples of World of Warcraft role-play are character-based conflicts such as the battles between Zarah and Takal'jin. Many of the stories I witnessed resembled a kind of soap opera where revenge was perpetually deferred, love triangles proliferated, and where death was always reversible. Finally, despite the dire and desperately melodramatic events that happened to all of our characters all the time, everyone grew steadily richer, more powerful and got 'cooler' outfits as their characters 'levelled up'.

Like soap operas, where the audience must be able to miss a couple of episodes without losing the thread of the plot, role-playing in World of Warcraft dwells on the minutiae of the relationships between characters. In The Tribe, the conflict between my character and the rest of the village functioned as a kind of narrative engine which fuelled many of the improvised role-playing sessions in which I participated.

Another narrative focus was the communal identity of The Tribe, with players constructing an elaborate fantasy of 'primitive' life for a tribe of trolls in Azeroth. Social hierarchy, xenophobia, and patriarchal gender roles were considered key to the fictional troll lifestyle, an interpretation which was strongly infused with colonial discourse, but might possibly also relate to the fact that any form of conflict is useful to narrative, and so themes such as these were a kind of narrative engine. The wedding discussed in this chapter is an example of an event where gender roles play a particularly important role in providing conflict.

Analysing speech events

Two sequences from the chat logs that I recorded during the troll tribe's preparations for the wedding are reproduced in Appendix A. This Appendix also provides a full analysis of how the guild understood the speech events and the players' use of game channels to demarcate the fictional frame of the role-playing and also to define their guild as a community. For reasons of brevity I will merely summarise the analysis of these logs, and refer the reader to the Appendix for more detail. The most notable features of the verbal performance in this speech event are the way players shift between the two 'frames' and the complex meanings of channel use in the event.

People apply 'metalinguistic labels' (Cameron, 2001) which show that the communicative events have a separate identity to them. In planning the wedding, and in subsequent discussions with a player from another server, who wanted advice on how to conduct a troll wedding, guild members referred to these two distinct stages of the wedding ritual as 'woman talk' (Chat log 1, Table 1, Appendix A) and 'the fight' (Chat log 2, Table 3, Appendix A). The rule-governed separation between 'in-character' and 'out of character' speech creates two distinct speech events within the overall speech situation – a role-played wedding in a troll guild on a role-playing server in World of Warcraft. The out of character event is a *role-playing event* of some importance for the guild. The simulated in character speech event is a *troll wedding*,

The 'floor' or attention of the group shifts between the two different events and their interpretative frames. At first, the female trolls from the tribe were gathered in one part of the village, while the male trolls gathered elsewhere, and they used the guild channel and another custom channel to communicate across the simulated spatial divide. The differences in participation across the available channels suggest possible gender and status differences in terms of 'ownership' of the guild channel and access to the conversational 'floor' in such interactions. These shifts during the 'woman talk' are outlined in Table 2 below.

During the 'woman talk', players choose to use the guild chat channel for all but one of their 'out of character' interactions. This is highly significant. One character who is attending the wedding and present at the woman talk is not a guild member and he is, to all intents and purposes, excluded from the out of character event. The analysis in Appendix A suggests that the use of the guild channel and its exclusive 'rules of seeing' is a deliberate statement of guild and individual identity.

Lines in chat log	Guild meeting	Woman talk
1-5	Commentary on events in 'man talk'	
6-7		Female trolls invited to advise the bride
11-20	Greeting new arrival, guild member Seleen	
21-29		Zarah offers a warning to Jinth'thiya, which is rejected Shak'tilah offers more suitable advice
30	Commentary on 'woman talk'	

Table 2: Communicative events during guild meeting

During 'the fight', all the tribe members gather to witness the nuptials. As the highlight of the ceremony, the bride and groom characters used the game's duelling system to fight one another with blunt objects, in a ritual contest to establish dominance in the marriage. During the 'woman talk', the conversational floor shifts between in character and out of character events. In 'the fight', the 'in character' event has everyone's attention for the duration of the sequence.

Jinth'ia's player later told the story of the wedding on the guild website, where she presented the 'woman talk' in traditional gendered terms as a peaceful discussion of 'women-things', and she reported the outcome of the fight as a narrativised version of the game mechanics: 'the tough warrior Jinth'ia rather quickly beat the voodoo priest Takal'jin'. The fight ended when the game system announces the expected outcome to the entire zone: 'Jinth'ia has beaten Takal'jin in a duel', and then the winner, Jinth'ia was asked to consent to the marriage. For the players, this win meant that the wife would be the dominant partner in the marriage.⁴⁴

Part of the players' enjoyment of 'the fight' related to the fact that they could take sides with Jinth'ia against Takal'jin, the feared hexxer. Takal'jin's character lost the duel since, according to the rules of combat, the priest class do not do well fighting in melee style. Here the players enjoyed the way the game mechanic allowed them to upset a set of gender rules which they themselves had invented for their imagined community.

⁴⁴ This tribe 'ritual' had been suggested by the *World of Warcraft* table-top role-playing books.

As in the case of the 'mind control' spell that was used on Zarah (discussed above), the high modality of the game's rules of combat are used selectively to punctuate or ratify an important moment within the improvised narrative. As is often the case with role-players and the game mechanics that they use to illustrate their narratives, the game simulates a different event to that which was in fact taking place. To The Tribe, the outcome of the duel was the equivalent of 'I do', to the game system, it was just another duel.

Conclusion

Not all participants are created equal.

(Henry Jenkins, 2006:3).

This chapter has demonstrated how role-players on a role-playing server of World of Warcraft have evolved a participatory form of narrative and a distinct community of players who value both the process and experience of participation and its textual products.

Gaining access to and participating in this collaborative community is not a simple matter. This chapter depicts the exclusivity of a small group of role-players, who guard their creative processes jealously and pay careful attention to the social proxemics which give them a distinct group identity. Their practices of 'verbal hygiene' and the practices whereby they select and exclude co-participants help them to maintain the discursive separation between in- and out of character speech by which they create valued narrative experiences. This exclusivity contrasts markedly with the public sharing and display of the stories and artwork which are the final products of their creative collaboration – over the course of a year, for example, players posted 7027 articles to the guild website.

Perhaps most notably, this mode of role-played interaction is barely supported by the game system in which it takes place. The PvP players discussed in the previous chapter have every win recorded and represented, as their ranks and the Arena provide a system of standing which allows finer numerical comparisons of players' virtuosity, and they go outside the game channels only to use voice communication. In contrast, role-players have to go outside the game circuits in order to record their achievements and to display their valued creations to their community. This disjuncture is clearly expressed by the fact that the wedding ceremony reported in this chapter was recorded by the game system as a 'duel'.

The convergence of media is a social process. Players use online games to produce a mediated experience, which includes constructing an appropriate group of co-participants. The identity of both audience and participants is narrowed and broadened at different stages of the process. The participatory channel constructed in the process (in this case the guild chat channel) is a key element of players' identity. The meanings of the channel and channel-switching in interaction is similar in many ways to the meaning of language and codeswitching in linguistic interaction.

Players use channels as a signifying mode so that, under certain circumstances, their utterances are interpreted as the speech of their characters, who have a distinct identity in a fictional 'frame'. Just as the choice of a language is often used to signal the enactment of an interpretive frame, players use the proxemic architecture of game channels to contextualise their statements differently. Within this architecture, it is important to ask the questions about who is allowed to enter the channel space, and under what conditions they may participate in the channel. Among those who may enter, who are the regular inhabitants who shape the activities within it (its owners)? Who are the users, who participate in the channel under conditions of clienthood? (Here I have adapted a framework for multilingualism suggested by Blommaert *et al.*, 2005).

This chapter suggests that role-players, like the children in Cape Town, are 'second-hand users' of media designed for other audiences, in that they use it for significantly different purposes to those envisaged by its creators (Nyamnjoh, 2002). Like the school children, the role-players make their own selections and domesticate the channel in ways which are significant to their own 'local' or community values. Where the signifying resources and 'writing-rights' provided by the game are inadequate to their purposes, the players utilise other channels of communication, media production and distribution, so that the game becomes merely one channel in a larger dramatic project.

It is possible that the neglect of the role-playing playstyle may have come about through a historical association of narrative play with women and girls, and a devaluation of players and those forms of play marked 'feminine' by society. It is very likely that such social prejudices and ignorance have also prevailed within the games industry, and that they have served to exaggerate the effect of the economic costs and technical problems associated with mediated and interactive approaches to narrative.

Chapter 8: Conclusion:

Affording discourse

Research in the social sciences and humanities often treats the internal workings of software systems as a kind of 'black box' (Mateas, 2005). Similarly, computer science and information systems researchers tend to ignore the relations of social power and inequality associated with the use of technology in society (Cooper *et al.*, 1995). These gaps are the focus of the nascent field of 'software studies', where researchers attend both to software's inner workings and its place in human culture (see e.g. Fuller and Fuller, 2008). This study contributes to software studies by investigating the relation between software systems and the social power of mediated discourse. I have addressed both these questions by investigating the relation between software systems and the social power of mediated discourse, namely, *how*, and *to whom*, *does software afford discourse*.

Software, when viewed as a form of discourse, provides fascinating new genres for social semiotics to explain and analyse, suggests a number of new research questions, and demands new methodologies. This study has demonstrated some possible strategies for research in this area, and has drawn on social semiotics to develop analytical and theoretical concepts which can be used by other researchers who wish to address questions of power, representation and social conflict in the use of software systems.

The methodologies demonstrated in this study suggest a way of tracing the semiotic connections between a designed artefact, and a person's experience of using the artefact in a particular situation. As such, these methods lend themselves to a wide variety of applications in software development. Design approaches which confront the challenge of accounting for user experiences should be able to interpret the role of mediation in these experiences, and to recognise that people's narratives and conversations about software, and verbal and gestural responses to these experiences are themselves semiotic data which should not be taken at face value.

The academic study of user experiences (known as UX) currently focuses on how to 'design experience' or generate pleasing affective and aesthetic responses to software products (Hassenzahl, M., & Tractinsky, N. , 2006). Social semiotics suggests the power of the user's agency in interpreting an experience, and would encourage a critical perspective on the designer's motivations. User experiences are both broader and deeper than the UX account suggests, and a social semiotic approach would try to account for the full range of experiences of users, including those who are not all (or not only) consumers, particularly those users who are not anyone's target market, possibly because of their age or gender, their marginal economic status, or their geographic location.

Understanding user experiences requires considerably more than the simple binary evaluation of a design – designs are not merely 'good' (positive aesthetic experiences which afford pleasure) or 'bad' (usability problems which cause pain) but they draw on the whole range of human representational and interpersonal meanings – as in the example of the pleasant responsiveness of the Google interface which achieves its ends by surveillance and concealment. Software designs serve economic and political interests, and this approach will allow a critical perspective which acknowledges the use and abuse of social and economic power in software, and the economic interests that drive the industry and shape users' experience.

The case studies that I presented focused on the uses of proprietary software, namely, educational software, two search engines, and an online game. The systems studied all have representational and communicational purposes (rather than, for example, being used primarily in manufacturing). My key findings about these genres of software include the following:

1. Software use responds to situationally specific 'rules of communication' or norms of interaction and interpretation (Hymes, 1974:60). These rules include the rigid simulated discourse encoded by a procedural genre of software and the shifting interpretive frames, social norms and discursive conventions within which software use takes place. Here it is important to take account of both the rule-governed genre of the system, and the rule-generating capacities of human semiotic interaction and language. These norms and rules reflect differential levels of access to computers, bandwidth and network connections, in that the expressive or indexical meanings of computer use varies depending on whether networked computers are scarce or everyday

objects in a particular context. This factor also influences access to interactive participants through this medium.

2. A key difference between the two groups of young people that I observed (South African school children and gamers from Europe) relates to whether they are using computers for mediated discursive interaction, or whether they are negotiating the quasi-semiosis of an automated system, in which they engage with second-hand media designed around the needs of other participants (their teachers, wealthy consumers from other countries, people for whom a computer is 'personal').⁴⁵
3. In discourse, software adjudicates and enacts rather than negotiates meaning, which brings about particular power relations between users and systems (and their designers and owners). These can be summarised by the difference between illocutionary and perlocutionary acts in human discourse on the one hand, and, on the other hand, the mediated action of a software system, which produces particular transient effects, and lasting artefacts. The relation between the user's illocution and the mediated action of a system is a crucial nexus for the working of social power.
4. Software genres are forms of multimodal discourse rather than a purely verbal dialogue, and, as procedural genres, they specify relations of surveillance, mutual monitoring possibilities, and the ability to construct, define, and represent an audience or an individual as an interactive participant. This allows them to use automated methods to tailor the application's visible affordances to a particular (construction of an) audience (also known as 'localisation', 'personalisation' and 'customisation'). These constitute what I have termed software's 'rules of seeing'.
5. 'Writing-rights' (Kress, 1994:21) reflect a system's assessment of the importance of the user's activity. Here it is possible to identify power dynamics in a system by asking 'Who is doing the writing?' and by looking for mismatches between the system's mediated artefact and the user's sense of what is valuable, what should be recorded and what should be transient about an activity.

⁴⁵ This distinction is to some extent a function of the particular classroom activities selected for this study. Another researcher's observations of email lessons taught at the school reflect the lack of correspondence between interactive and represented participants – children share email addresses, and, when instructed to send an email to a family member, they seldom have anyone to whom they can send the emails they write (Pallitt, forthcoming).

6. When one analyses the power relations and patterns of mediation in proprietary software, it becomes difficult to maintain the notion of 'contact' between addressee and addresser via a 'channel' (Jakobson, [1960] 1986:50) where the 'physical channel' is something separate from a 'code'. In digital media, channels are simulated in the signals of binary code that are transmitted as electrical impulses in physical conductors and in the changing frequencies of electromagnetic radiation. People are able to make contact with these signals via the ensembles of software and hardware that can receive, process and display them. Interactive participants (Kress and Van Leeuwen, 1996:119) use natural language and other semiotic resources to communicate via simulated channels. Gaining access to these channels requires gaining access to a represented participant, which is part of the procedural definition and protocols of the simulated channel.
7. The convergence of moments in the processes of mediated communication, and the role of quasi-semiosis at all stages of the production, reception and distribution processes, suggests that the single production-distribution-reception circuit model is now a complex, distributed and inter-related set of multiple circuits. In proprietary software, these can be described as follows:
 - a. *User circuits* – the rules of the user interface for software users, who operate a relation of clientship to the software owners (there may be multiple users).
 - b. *Channel circuits* – the rules by which the system processes, stores, and transfers messages, sequences discourse into paradigms and syntagms, establishes default values, and subcontracts rights for the creation of internal channels.
 - c. *Owner circuits* – the rules of the user interface of the system owners, most notably the source code of the system. Software owners have writing-rights to the source code, and profit economically from the system (owners may include multiple stake-holders).
 - d. The rules of the user interface include *writing-rights* and *rules of visibility* (or audibility in audio interfaces).
8. The power-relations encoded into software can be expressed as an action path diagram, or a verbal procedural genre, which can both help to represent the relations of compulsion and choice which a system imposes on a user. The approach I have suggested is to adopt a 'second person' perspective, which does not aim to represent the system as a whole, but

rather helps to clarify the power relations of the system as a user might experience them, when trying to achieve a particular task. This can be visual (an action path) or verbal (using the second person pronoun and modal verbs such as 'must', 'must not', 'should', 'may', and 'might') and should represent the system in terms of any goal rules it assumes, and any manipulation rules it affords. These rules can be derived from the relations of compulsion and choice in the system. As Manovich (2001) suggests, the combination rules (syntagm or algorithms), and the selection rules (paradigm or data structures) should both be considered. The representation should differentiate between the procedural resources which are essential to achieve the goal (i.e. 'must'), normative default values, (i.e. 'should'), affordances implicit in the system (i.e. 'might') affordances which are explicitly represented in the interface (i.e. 'may'), and affordances which are excluded from the system altogether.

9. Genres of software encode these power relations very differently. The explicitly normative power relations of educational software are compared to the dissimulated freedom of the search engine interface, which serves hegemonic interests through its default values. In the role-played discourse, conflict is negotiated through the semiotic resources of dialogue and narrative cohesion, while in the combat game, the outcome of conflict is adjudicated by automated processes of quasi-semiosis.
10. When software encodes and adjudicates discursive contests, the numerical representation of contestants is accorded a particularly powerful modality, since this form of representation is most easily subject to the operations of quasi-semiosis. In this study, these modality systems are seen to apply to contests over knowledge (educational software) visibility and attention (search engines) and the rewards of 'masculinity', community recognition and other spoils of game-based combat.

These findings represent a few starting points that may help in understanding how and to whom software affords discourse, but there are many more distinct areas which remain to be explored, some of which might include the semiotic practices at work during the design, development, testing, marketing and choice of software and information systems, the relation between software and manufacturing systems, the social context and history of interfaces and systems which are no longer in use, the sharing of interfaces and procedural resources among users of social networking systems, and the very specific practices associated with the development and use of open source software.

Significance

By investigating two diverse contexts, this study has delineated the key role of context and user agency in the use of software, thus providing further evidence against the common tendency to attribute exclusive agency to technology. By situating the use of software in relation to key social issues, it addresses the invisible power relations and social meanings which underpin technology use, and highlights the unacknowledged interests often served by the design of software.

The framework presented in this study can help to develop social semiotic and multimodal theory to account for the procedural resources of software in human semiosis, in relation to the social processes, identities and relations simulated by software systems. The identification of power dynamics in the attribution of participatory rights, including writing rights, and the nature of permanent contributions made by user actions to the system suggest several new areas of investigation for the study of participatory media, digital literacies, computer-assisted learning, informal learning and fan communities associated with games. The examples analysed present evidence of the way in which the social interests and literacy practices of global elites are encoded in software, and how this affects less powerful and marginalised groups of users. The methodology allows for the study of the mediating work of software, and for new approaches to transcribing multimodal discourse.

Inter-disciplinary contribution

This study is intended as a contribution that might help to establish semiotic approaches in human-computer interaction (De Souza, 2005) and presents a further use of the language/action perspective which has already yielded important insights in the discipline (e.g. Winograd and Flores, 1986). Here, I have focused on developing the notion of discourse (and multimodal discourse) which acknowledges the importance of meaning-making patterns beyond the individual sign and the linguistic sentence, by drawing on a tradition (rooted primarily in linguistics) which acknowledges the social, political, and economic interests at play in discursive interaction and representation, and which has come to recognise the social significance of variation in discourse (e.g. Hymes, 1974; Halliday, 1978; Gumperz, 1982; Street, 1984; Kress and Van Leeuwen, 1996; Gee, 1999; Jewitt, 2006).

I argue that social semiotics and the study of multimodality can benefit from embracing the vocabulary of software design and use developed in the field of human-computer interaction, and from addressing the insights of researchers from

this discipline, particularly from the tradition of field studies and other 'post-cognitive' approaches, including activity theory, ethnography, and ethnomethodology (Winograd and Flores, 1986; Suchman, 1987; Bannon and Bodker, 1991; Cooper, *et al.*, 1995; Dourish, 2004; Kaptelinin and Nardi, 2006). A digital materialist approach to analysis would (Manovich, 2001) analyse the textual construction of software systems, while recognising the contribution in the interface of simulations of other semiotic modes. To once again underline De Souza's point 'the message is the medium' – the digital medium is itself semiotically constructed (De Souza, 2005: 254). Finally, the situated meanings of software use can draw on the insights of cultural studies and political economy (e.g. Buckingham, 2007). The field of games studies provides a crucial meeting point between technical and humanities disciplines, and this field suggested several of the key concepts for this study, particularly those relating to simulation, rule, and software as procedural genre.

As a self-appointed translator between disciplines I have tried to make some new connections, and I hope that this project will be evaluated in that light. At the same time, I understand that I have sacrificed some depth in this study because of the objective of communicating across disciplines, and that this approach may have smoothed out deep epistemological and theoretical wrinkles, such as those between speech act theory, social semiotics, and ethnography. Anyone who assumes the role of interpreter should probably always be viewed with some suspicion.

Representing conflict

Software, as rule-governed discourse, mediates between people, and offers particular narratives or genres for their interaction. This study has documented some of the affordances of software as mediated discourse. I have focused on genres where software acts as the referee of discourse by representing some discursive interactions in numeric form, as when a game system represents the actions of players in multi-player combat, generating the visual, turn-based discourse discussed in Chapter 6. Higher stakes for winning the contests are associated with the contests discussed in previous chapters – voting software, children competing for the high score in assessment at school, or websites competing for attention in search engine results pages. The power relations, the rewards, and the penalties of such mediated conflicts are all politically, economically, ethically and socially significant. This study suggests a framework for understanding conflict in simulated discourse, which centres on the following questions:

- What is simulated?
- How does the simulation contribute to the communicative event?

- Is there a quantifiable goal or outcome to the simulated conflict?
- What are the goal and manipulation rules in the simulations?
- What role does the outcome play in the overall communicative event?
- Are participants aware of the rules of the simulation?

Semiotic metafunctions in software

As explained in Chapter 1, the ideational, interpersonal, and textual semiotic metafunctions have shaped all existing semiotic resources, and these dimensions of meaning can all be investigated when studying software systems. As Jewitt's approach suggests (2006), studies need to acknowledge that a process of redesign takes place whenever software is used.

Semiotic resources such as image, writing, sound, music, and moving images are all present (remediated, or simulated) in software systems, and so they should be discussed as a multimodal ensemble. Output modes such as audio, video, image, writing, verbal language, and haptic feedback are most obvious. Input modes are just as important and often neglected. They are more complex to theorise, since the hardware such as an alphanumeric keyboard, pointing device, touch screen and gestural devices (e.g. the Nintendo Wii controller) work in combination with operating system affordances such as a command line system, a search-based or a graphical user interface, and a three-dimensional rendering algorithm.

When analysing the rules of the simulation or the system itself, researchers can ask the following questions:

Ideational

What kind of world or system does the software construct, or simulate? What categories, and objects are defined? In particular, what kinds of media objects or semiotic modes have been encoded? What actions and procedures have been specified? How can this world be adapted or extended? What do the rules of the system afford, constrain and exclude? Who are the represented participants?

Interactive

What rules of social or communicative interaction are specified for the system? How do represented participants relate to interactive participants? Whose actions are represented? And who and what do these actions affect? What rights and powers are these participants given within the representational system? What relationships, proxemics, and modes of interaction are encoded between different users, and

between users and the system? Who can see what? Who can create, record, and access media? In what semiotic modes? What consequences do the representations in the software system have elsewhere in the world? How does the system act in the world? Who is allowed to interact, and under what relations of ownership, or clientship?

Textual

What hardware and software is required to use the system? How do people communicate their commands to the system? What protocols, procedures and other coded resources does the software 'call' or assume are available? What combinatory and sequential rules are coded? How are cohesive ties between elements specified, authored, and automated? What assumptions are made about future uses of the system?

System in use

How do users redesign, interpret and use this simulation as an ideational, interactive, and textual resource? What signs do they themselves make with it?

Writing-rights

When considering software genres as bundles of rules that govern communicative events, it is also important to ask how they allow users to participate in the discourse, what semiotic resources they make available, and what status and persistence is accorded to their contributions. People create meaning by assembling messages from the available resources. In digitally mediated environments, the software producers decide which resources are available to which participants. Software is a productive medium which can be used to produce and record media. Media produced with software include digital versions of most traditional forms of media and also software, which is a medium in its own right.

Software genres also vary in the extent and nature of the affordances they provide for media production. While we speak easily of the seemingly unlimited affordances of digital media, it is important to remember that the flip side of affordance is constraint. In a medium where anything is possible, the presence of constraints reveals the operation of social power. Affordances speak of a more subtle form of power – the power to configure an activity, or to constitute a category of users in particular ways.

Thus, to some extent, the encoded rules of the medium afford and constrain participation by determining what representational resources (or semiotic 'modes') are available to various participants within the represented interaction. Software thus has the power to allow and deny certain participants the right to create or connect in certain ways. It determines what representational resources are available for their use, whether the representations they create are transient, whether they are recorded for future use, whether the texts that are produced are intentionally authored productions, or automated 'logs' or recordings generated for the purposes of surveillance and 'data mining'. Here it is important to ask what the constraints and enabling factors are for the various participants in the process of production of digital media, and what their 'writing-rights' are in that particular channel.

- What transient system representations are produced by user interaction (mediated effects)?
- What persistent system representations are used as signifying resources in the design?
- How do users customise and modify the interfaces?
- What artefacts does the software record (in digital media) or produce (in other media) (mediated artefact)?
- What persistent media do users produce in and around this discourse?

Genres of discourse

Kress defines genres as forms of discourse which specify '*who acts (and) in relation to whom*, with the question of purposes' (Kress, 2003:84, emphasis in original). The structure of the conventionalised interactions in software reveal a range of procedural genres, and the character of each genre is revealed in the representational practices and the differential representational powers allocated to participants in each software genre.

Different genres of software have developed to generate and regulate distinct varieties of discourse. This study focuses on proprietary software. The purpose of the software is seen as 'education', 'search' and 'gaming' respectively, but media production is an important function of each application.

The nature of transient representations afforded to users allows them to shape their experience by representing their interactions on the screen to themselves, and sometimes, to users or other players. The nature of the transient representations suggest the quality of engagement and the experience of using the various software genres – the huge flashing red screens and animated negative feedback associated

with an incorrect answer shapes the user experience in educational software just as the spatial simulation shapes the experience of PvP combat. The disposable Google search results suggest that these results pages are not worthy of study, and the transience of chat logs and discussion forums in World of Warcraft have a similar implication regarding the semiotic activities of players. How do we explain the differences between the experiences afforded by a simple pointer and a game character as represented participants, or a hidden participant such as the Google cookie? In multi-user applications, the rhythm and modality of the interchange are equally significant – the slower textual and visual collaborations and freedom of improvisation in a role-played narrative can be contrasted with the rapid pace, nimble movements, multimodal reading and sudden snuffing out of an opponent in PvP combat.

The distinction between owner and user circuits means that each example of proprietary software discussed in this study is characterised by a structural power imbalance between designers and users, which is reflected in the transience of the users' own semiosis, as, for example in the non-existent writing-rights accorded to children by the educational software which mendaciously promises to promote literacy. A similar phenomenon is seen in the limited writing-rights associated with a nominalised concept of character in World of Warcraft. The comparatively limited semiotic resources available to users contrast with the relative permanence and high modality of the numerical representations used by the designers to record certain users' activities. The existence of competing representational economies reflects this imbalance, and characterises user cultures – children using educational software focus on achieving a high score, PvP players emphasise the numerical representations which are central to the game mechanic, while role-players complain that the game is entirely innocent of their valued narrative representations. Finally, the interactions, similarities and differences between semiotic (what things mean) and economic (what things are worth) dimensions of meaning are worthy of further study. They are apparent where children focus on the verbal representation of search results, while the search engine conceals the numerical representations, algorithm, and page ranks which it uses to 'answer' their questions.

A key social feature which has received almost no comment is the fact that now considerable areas of human discourse are coming to be characterised by the peculiar constraints and affordances of machine semiosis. Human communication is both augmented and adjusted in the process. By delegating important interpretive functions to the kind of machine semiosis found in educational software and search

engines, we are developing a new kind of writing, which records experience for future processing as a 'brute pattern of behavioral events' (Geertz, [1973] 1994:218).

Thus software genres are encoded representations of social power which produce, regulate and mediate human discourse. Software production can thus be seen as a kind of performative ethnography. Just as ethnographers inscribe and draw out the significance of social discourse by writing down their interpretations of events, software designers record patterns of social interaction in the software they produce – whether it is the classroom discourse discussed in Chapter 3, the question-answer structure of search engine use discussed in Chapter 4, or the visually mediated competitive turn-taking of game combat discussed in Chapter 6. Once used, the software mediates social interactions in a performative rather than narrative genre that gives shape to particular meaning relations and social positions. In so doing, the passing events of social discourse which exist only in a 'moment of occurrence' (Geertz, [1973] 1994:223) are solidified and automated for future re-enactment whenever the software is used. Geertz quotes Ricouer, who asks 'what does writing fix?'. According to Ricouer writing conveys the gist of speech, 'the meaning of the speech event, not the event as event' (Geertz, [1973] 1994:224). Software is a new form of writing which takes the ethnographic project one step further: it has the capacity to fix particular communicative events in encoded, performative form and thus to allow for new forms of mediated discourse and action.

In HCI (human-computer interaction), ethnography has conventionally been used to get to know a particular target group of software users, and to understand their problems and social context better. Since ethnography in HCI so often serves as a design methodology, it rarely documents or reflects on the far-reaching influence of the implemented and successfully marketed systems. Focused on going 'out' to the field, where software is used, it has more rarely turned its focus inward, and seen the culture of software development as part of the 'field' that could be investigated.

The significance of small events and multimodal discourse analysis

This study asserts the significance of communicative events and individual experiences of meaning in software use, arguing that it is worth taking the trouble to understand individual social acts in their specificity, and to demonstrate a respect for the complexity of sign-making. In that respect, the study shares an ethnographic respect for the particular. It recognises that significance can be found by observing the small as well as the large scale, and finds meaning in the minute details of

existence, such as 'the complexity and uniqueness of significant events in the life of a bird or the life of a human being' (Mead, 1962:134.) The interpretive and diagnostic resources of discourse analysis and social semiotics are used to derive more general conclusions about software as mediated discourse.

The individual narratives in this account are not intended to be taken as representative of all interactions, nor are these accounts of individual users intended to substitute for those of all other users. Instead, they are offered as a representation of certain experiences which need to be explained in their own right, as semiotic processes. Similarly, different contexts and users would generate different insights. I hope that, in future, such conversations will open up the potential for documenting more and radically different experiences of using software.

A closer analysis of language and other semiotic systems confronts the researcher with the evidence of another human being's processes of sign-making in a particular context, and thus invites her to attend to the full complexity of their surroundings, motivations, beliefs, provenance and desires. Engaging with this evidence on its own terms is a journey of getting to know another person, of experiencing a different mindset, worldview, or moment in life, and this journey often elicits empathy, recognition, and a humbling experience of respect for the complexity and nuance of human social existence. Sometimes it delivers a very necessary epistemological slap in the face, as the researcher is forced to recognise and confront her own social positioning and 'otherness' to someone else. At its best, it resembles a meaningful dialogue. And, like any meaningful dialogue, it is a slow, incremental process, where one's own motivations, interests and preconceptions as a researcher shape what can be seen. In my own experience, these motivations blocked the view entirely at times, and sometimes offered startling insights. I am aware that they are in evidence throughout the written record of this project.

By analysing the details of how both software systems and users construe the world in certain ways rather than others, we can interpret the cultural models, discourses and 'rules of communication', (by which I include the 'rules of seeing') at play in a particular interaction. We can arrive at an approximation of another person's sense-making processes as they interact with other people and with their surroundings. We can also see what happens in a particular interaction when one form of discourse coheres, or clashes with another.

The signifiers, or physical marks, recordings and other traces of language and other forms of semiotic communication, constitute the only substantial evidence for what is happening in any kind of human social interaction. As such they are worthy of closer attention than they often receive. They provide access to processes of learning, economic activity and work, mediated communication, and play. It is worth pointing out that all researchers collect evidence of and gain access to human social interaction by engaging with semiotic processes, or by reading the traces of semiosis in the accounts of those they interview. For example, a research interview, like other interviews, is a particular, highly structured speech event which suggests certain kinds of speech acts, social relationships, and meanings to its participants (Rapley, 2001). A laboratory study where a team of researchers watch a person who has been paid to complete a list of pre-specified tasks in a particular order, and whose actions are recorded by three different video cameras constructs a uniquely asymmetrical social situation which frames what happens in that context. A role-played interaction in an online game with someone who claims to be a researcher from South Africa 'in real life' takes on a different flavour to another such event where none of the participants have confessed to such exotic motivations.

It is all too easy to treat language and other signs as a mere source of information, and to take peoples utterances and semiotic messages at face value. We are perhaps more attuned to pay attention to 'what' someone is saying than to 'how' they are saying it. It is also entirely usual to 'interpret' someone else's utterance without reflecting too deeply on the power relations that influence how we have crossed the intersubjective gap between their illocution and our perlocution.

Consequently it is not surprising that even qualitative researchers often do not always pay attention to the social functions and uses of language, and less so to other forms of human communication. When, as researchers, we are not aware of these details, language (in the broadest sense) is being used *on* us by someone who is expressing a particular relationship, a particular identity, and who is conveying to us, via intertextual meanings, a specific experience of life. Similarly, our own use of disciplinary language *on* our research participants and our largely unconscious interpretations of and beliefs about their identity are often not acknowledged. This is, to some extent, inevitable. Nonetheless, a different knowledge of human interaction can be produced by taking note of the specific signs from which it is made, the activities within which they are produced, and by asking why these particular signs were chosen, over all other possibilities. Most importantly, this knowledge comes about by engaging with research data as signs, rather than as 'facts'.

Not all research needs to confront such matters or to take such a close-up view, but I would argue that if a researcher sets out to represent another person's experience, acknowledging the importance of that person's use of language and other semiotic resources is a good starting point.

Understanding discourses or ways and forms of life and explaining how these are enacted through semiotic interaction has a value in itself. In the case of the computer lab classes I observed, the teachers in Mountainside Primary, the software designers and marketers at Google and in the United Kingdom, and the playground practices of Athlone children all contribute to the meaning of the events, and a deeper knowledge of any or all of these contexts would have improved my study significantly.

My major purpose, however, was not to provide a full account of any of the contexts that I studied (and it would be impossible to define the conditions for such a state of completeness). Instead, this study depicted:

- The complexity of the practices that contribute to software use.
- The role of language and other semiotic resources in shaping and signalling 'what people are up to' when they design and use software.
- The social relationships that are established in and through proprietary software use – multiple layers of compulsion, ownership, clientship, and sometimes rebellion.
- The (multimodal) 'writing-rights' which are differentially accorded to software users through mediated actions and artefacts of interaction.

Multimodal discourse analysis helps to reveal the social relations between a designed system and a person motivated to use that system for some purpose.

Contemporary theories of discourse and representation will be better able to account for the role of software in communication if researchers follow the example of human-computer interaction and study software users. In future, I hope that such theories will provide vocabularies for education so that children and students learn about software and its procedural resources for meaning just as they currently learn about spoken and written language, visual expression and music. (In that sense, as Buckingham [2007] and Burn and Durran [2007] suggest, our knowledge of human-computer interaction and games studies should be part of the school curriculum and

contribute to media literacy programs). In the past, the designers of computer languages were taught 'grammar' at school and so they simulated nouns, verbs, and the syntax of written language in the computer systems they developed. Similarly an analytical understanding of other 'grammars' and modes of semiosis has the potential to provide new ideas and analogies for computer languages, software genres, and information systems.

Finally, I would argue for the value of analytical methods which address what is going on when software is used, and which record the actual, rather than ideal, relations between circuit owners and circuit users, in order to address economic and social issues without being beholden to the profits of the owners of the system. I have suggested a 'second person perspective' on software use, which, I would hope, could encourage those who design, buy and use software systems to recognise the full interpersonal impact of a system on the experiences of people and on the kind of society in which we live. It is, in part, a challenge to look for ways in which dominant ideologies associated with software production could be occluding the actual interests of significant groups of users (such as the role-players and female gamers whose narrative interests are so poorly understood and supported by World of Warcraft's developers ; or the children confronting literacy software which is designed for teachers' convenience rather than to mediate their learning, or the illiterate voters who are expected to use text-only electronic voting systems).

Such a perspective requires a move beyond the traditional focus in HCI on 'the client' and 'the user' (or a couple of 'user profiles'. Instead, researchers could document the experiences of those who are neither clients (the owners of the code), nor configured as users (those who buy the software). In online media, they would be considered 'poor quality traffic' (users who do not live in the area or buy products) and so they often do not even attract advertisers and publishers. This constitutes a challenge to see systems from the perspective of those invisible 'others' who apply significant amounts of creativity and resourcefulness, while being in the invidious position of being 'second-hand users' of systems designed for wealthier consumers in considerably better-resourced contexts.

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Appendix A: Analysis of channel-switching

In the transcript below (Chat log 1 in Table 1, the female trolls from The Tribe were gathered in one part of the village, while the male trolls gathered elsewhere. The differences in participation across the available channels suggest possible gender and status differences in terms of access to the conversational 'floor' in such interactions. In both transcripts the out of character event is a *role-playing event* of some importance for the guild. The in character speech situation is a *troll wedding*, and two distinct stages of the wedding were selected for transcription. Players apply 'metalinguistic labels' (Cameron, 2001) which show that the events have a separate identity to them. In planning the wedding, and in subsequent discussions with a player from another server, who wanted advice on how to conduct a troll wedding, guild members referred to these two distinct stages of the wedding ritual as 'woman talk' (Chat log 1, Table 1) and 'the fight' (Chat log 2, Table 3).

The transcription above uses my chat log as a starting point. Just as the visual scene is composed around my physical perspective, so the chat log displays my discursive perspective in that it reflects all the text events in all the game channels which I had joined. Other players would have had a very different perspective on the scene.

This indicates a key point – game events are constructed around and reflect the perspective of the player and their position in a social network. The transcript is notable in that my player is not connected to close friends in any party chat or engaged in any dialogue (via whispers). This reveals my social distance from the other players in the guild at this stage of my research.

The Hotline channel is used for the guild to be able to communicate even when they are playing on their 'alt' or secondary characters, and it is also available for players who want to participate in the guild's role-playing but do not belong to the guild. It is an open channel and can be joined by any player on the Horde faction.

Many of the players in the guild are not English-speaking, but the primary language spoken in the guild chat channel is English, and all the utterances in this transcript are in English, although many players spoke Swedish to one another in other channels.

Each 'race' in the game also has a particular 'language', which players use to restrict the audience of their speech. This is not a true language, but merely masks the player's true words to other players who do not 'speak' the language. The default language is set as Orcish, and so players who have changed the language to troll have made a particular choice of identity and audience – no one but trolls will be able to understand them.

Speech events

In the chat logs below, the rule-governed separation between 'in-character' and 'out of character' speech creates two distinct speech events within the overall speech situation – a role-played wedding in a troll guild on a role-playing server in World of Warcraft.

University of Cape Town

Chat log 1: 'Woman talk'

- 1 [Guild][Zel]: My god,
Zul'maran looks...wild :D
- 2 [Guild][Zul'maran]:[Troll] *bows*
- 3 [Guild][Zel]: Hehe :D
- 4 Jinth'iya looks really nervous about all this
- 5 [Guild][TakaI'jin]:xD I love how the three men are just sitting calmly nodding almost in unison
- 6 [Shakti'la] says:[Troll] Anyone of ye have advice for da woman Jinth'iya? She gonna be mate now. She need support an' help
with all she needs tha know
- 7 Zarah keeps her gaze down, inspecting the fine sand of Darkspear Strand with minute attention.
- 8 [Guild][Zul'maran]: [Troll] Old geezer club! :P
- 9 [Guild][Jinth'iya]: [Troll] ^^ Man talk
- 10 [Guild][Zel]: Hehe :D
- 11 [Seleen has come online].
- 12 [Guild][Jinth'iya]: [Troll] Seleen o.o *gasp*
- 13 [Guild][Seleen]: Here as promised to Jinth'iya!
- 14 [Guild][Jinth'iya]: Seleeeeen!
- 15 [Guild][Jinth'iya]: *snuggles much*
- 16 [Guild][Jinth'iya]: Yaay!
- 17 [Guild][Zel]: *hugglorz*
- 18 [Guild][TakaI'jin]: Wheee!!
- 19 [Guild][Jinth'iya]: Get here fast ^^ they're having the woman talk.
- 20 [Guild][Jinth'iya]: *huggles lots*
- 21 Zarah says: Well... she's goin to need to know bout runnin real fast.
- 22 Jinth'iya looks confused.
- 23 [Shakti'la] says: [Troll] Zarah...
- 24 [Jinth'iya] says: [Troll] What?
- 25 Zarah suggests helpfully.
- 26 [Zarah] says: Eh...
- 27 Zarah shuts up for a long time.
- 28 Suljiya doesn't know anything to say and keeps silent.
- 29 [Shakti'la] says: [Troll] Ye need tha kno' how tha cook, how tha sew. How tha take care of ye mate.
- 30 [6. Hotline][Jinth'iya]: I guess this would be more point if we actually had married people in the tribe ^^

Table 1: Chat log 1: 'Woman talk'

As described above, the two events which constitute this role-playing session are characterised by very different rules of speaking. Chat log 1 (Table 2) reveals that the 'floor' or attention of the group shifts between the two different events and their interpretative frames. These shifts are outlined in Table 2 below:

Lines in chat log	Guild meeting	Woman talk
1-5	Commentary on events in 'man talk'	
6-7		Female trolls invited to advise the bride
11-20	Greeting new arrival, guild member Seleen	
21-29		Zarah offers a warning to Jint'hithiya, which is rejected Shak'tilah offers more suitable advice
30	Commentary on 'woman talk'	

Table 2: Communicative events during guild meeting

Chat log 1: Out of character event – Role-playing session

The out of character event is 'role-playing' – here players gather to enjoy an important role-playing event which centres on the in-game wedding of two of the guild officers, and to get together as a group of friends. Discourse is informal, and players use emoticons and narration to express their closeness, excitement and affection for one another. All but line 30 are also assertions of the group's identity as a guild.

Out of character speech acts fall loosely into two kinds of contribution, namely 'watching the role-played performance' and 'being with friends while role-playing'. As set out below, 21 of the 30 lines focus on expressing the players' pleasure at being together and narrating the closeness of the group of friends. Just under a third of the lines are a kind of commentary on the role-played performance, which includes summarising the action for other players who are not there, directing a player to do something in the scene, and commenting on the performance in some way. Most of the commentary on the ongoing action is a kind of joking applause for the men's performance, which communicates the events in the 'man talk' to the guild, while the events in the 'woman talk' are not shared in the same way.

Watching the role-played performance	9
Applaud/insult the men's performance	5
Summarise the action	2
Direct a player to do something	1
Comment on the women's performance	1
 Being with friends while role-playing	 21
Smiley emoticons	8
Narration of closeness and affection	5
Other narration	1
Exclamations	4
Announce presence	2
Greet	1

The following five structures characterise the situational choices for all out of character interactions in the logged sequence. Together these decisions determine the audience and character of the interactions. All interactions are in World of Warcraft on an EU English role-playing server. All out of character communication is via in-game text chat. The following channel choices were made.

WoW>EU-English>RP>Horde character>Troll guild chat>'Trollish'>English
 WoW>EU-English>RP>Horde character>Troll guild chat>'Orcish'>English
 WoW>EU-English>RP>Horde character>Hotline>English
 WoW>EU-English>RP>Horde character>Presence message

There is one automated presence message, which announces that a guild member has logged in to attend the event. This message immediately shifts the focus onto the new arrival and shifts the 'floor' to the guild channel.

Players choose to use the guild chat channel for all but one of their 'out of character' interactions. This is highly significant. One character who is attending the wedding and present at the woman talk is not a guild member and he is, to all intents and purposes, excluded from the out of character event.

While the male trolls use the guild chat channel to relate their enjoyment of the role-playing experience to the female trolls, the female trolls do not relate their in-character event to the male trolls, with the exception of Jinth'iya, one of the guild

officers. Jinth'iya, whose character is the bride-to-be, uses the more inclusive Hotline channel to communicate with the entire group when she comments wryly in line 30 on the 'woman talk' event.

Chat log 1: In character event - 'Woman talk' on Darkspear Strand

The in-character event is a verbal event referred to as 'woman talk' by the players. This is conducted as a serious discussion, where the women trolls gather under the leadership of Shakti'lah, the Spiritmaster of the tribe. The following channel choices are made:

WoW>EU-English>RP>Horde character>Darkspear Strand>Females>'Orcish'>English>'Say'channel
WoW>EU-English>RP>Horde character>Darkspear Strand>Females>'Trollish'>English>'Say' channel
WoW>EU-English>RP>Horde character>Darkspear Strand>Females>'English'>Narrated 'emote'

Shakti'lah invites the female trolls to help her to explain a woman troll's responsibilities within the patriarchal tribe. Players imitate the Blizzard characterisation by adopting versions of a stereotyped 'Jamaican' dialect. However, discourse is considerably more formal than the out of character exchanges in the guild chat channel. The bride is anxious, and the conflict between the female trolls and Zarah is apparent. Zarah was still considered 'scum' by the tribe, and her poor relationship with Takal'jin is also apparent when she issues a veiled warning that the bride may have some trouble with the groom. She is warned to stop by Shakti'la. Shakti'la dismisses Zarah's suggestion, and concludes the session by instructing the bride to learn conventional domestic and feminine skills – cooking, sewing, and how to take care of a mate. I suspect that this patriarchal domestic arrangement is somewhat exotic to the young Swedish women who played Jinth'iya and Shakti'la.

Jinth'iya's player later told the story of the wedding on the guild website, where she presented the event as a peaceful discussion of 'women-things' and contrasted it to the drunken and stoned behaviour of the male trolls:

The men sat around smoking weed (and as a result behaved very strangely during the ceremony) and talking about all the things the husband-to-be would have to do as a married man, while the women gathered by the shore to talk about women-things. What you need to know about marriage and kids and such things. (Guild website)

Chat log 2: 'The fight'	
1	[Zeljin] says:[Troll] Cam on womonette!
2	[Guild][Zul'kis]:*watches the fight on Baliajah's screen*
3	[Jinth'iya] says:[Troll] What?
4	[6. DSTHotline][Zel]: <3 Giant club :D
5	[Zarah] says:[Troll] Do somethin horrible...
6	[Tikal'jin] says:[Troll] I'm not THAT bloody stupid.
7	[Guild][Zel]: *pats*
8	Ziata glares angrily at you.
9	[6. DSTHotline][Azathoth]: Fight fight!
10	[Jinth'iya] says:[Troll] Talkal'jin, come on, it has to be done.
11	[Baliajah] says:[Troll] oh realleh?
12	[Tikal'jin] says:[Troll] I'd rather wrestle a kodo bull. [Duel takes place between Jinth'iya and Takal'jin]
13	Jinth'iya has defeated Takal'jin in a duel.

Table 3: Chat log 2: 'The fight'

Chat log 2: In character event - 'The fight'

Unlike Chat log 1, where the floor shifts between in character and out of character events, in Chat log 2 (Table 3), the in character event, which players refer to as 'the fight', has everyone's attention for the duration of the sequence.

The bride and groom characters used the game's duelling system to fight one another with blunt objects, a ritual contest to establish dominance in the marriage. The bride reported that they had taken the idea for 'the fight' from the World of Warcraft tabletop role-playing game. Here, despite The Tribe's officially patriarchal social structure, the game mechanics allowed Jinth'iya's powerful female warrior character to prevail over her weaker mate, in a moment appreciated greatly by all the guild members. The compelling nature of the role-played event is evident in chat log 2 (Table 3), where two frames converge to some extent, with both players and characters watching the duel. A third frame converges as well, since Zul'kis, whose character is not present at the wedding, types a message to indicate that he (as a person, rather than player) is turning away from his own computer screen (which shows his perspective as player) and joining up with the guild for the wedding, by

watching the fight on his friend Baliajah's computer screen: '[Guild][Zul'kis]:*watches the fight on Baliajah's screen*'

The characters encourage the fighters, mostly taking sides with Jinth'iya against Takal'jin, who is considerably less popular as a character. Takal'jin refuses to fight, as the bride is a warrior, and, according to the rock-paper-scissors structure of combat he knows that he will be beaten. His character is a priest, and does not do well fighting in melee style. As in the case of the 'mind control' spell that was used on Zarah (discussed above), the high modality of the combat game mechanic is used selectively to punctuate or ratify an important moment within the improvised narrative. Although there are several out of character interjections (in lines 2, 4, 7, and 9), they do not shift the conversational focus or 'floor' away from the in character interaction.

Out of character, Takal'jin's player is a respected officer of the guild, and receives a narrated pat in the guild chat from the guild leader, possibly to express sympathy for his impending public humiliation. The fight ends when the game system announces the expected outcome to the entire zone: 'Jinth'iya has beaten Takal'jin in a duel'. As is often the case with role-players and the game mechanics that they use to illustrate their narratives, the game simulates a different event to that which was in fact taking place. To The Tribe, the outcome of the duel was the equivalent of 'I do'.

The most notable features of the verbal performance in this speech event are the way players shift between the two 'frames' and the complex meanings of channel use in the event.

The use of spatial proxemics to divide the male and female trolls has some interesting consequences, which do not necessarily have to do with gender. The events of the 'man talk' are summarised and applauded for the whole guild, but the same is not true of the 'woman talk'. Seven, or almost half of the 15 turns in the guild channel consist of a commentary about the events among the male trolls, with six of these comments made by male trolls. The male trolls use the guild channel to provide a kind of 'running commentary' to the female trolls about their activities. While the males communicate about their activities in the guild channel, the females do not reciprocate, except in the stripped down summary presented in line 30.

This difference may also be related to differences in what took place at the 'man talk' and the 'woman talk'. Quite possibly the drunken and stoned behaviour of the

male trolls is considered more amusing and newsworthy than the serious and somewhat tense discussion between the females (which itself reflects the players' notions of how to perform troll genders). However, the players' reports suggest a somewhat dull stage of the events, they depict their characters as 'old geezers' 'nodding in unison'. At any rate, all three of the male trolls participating in the event at this stage use the channel to communicate with one another out of character, and to convey their doings to the female trolls. Only one of the female trolls (who is also a guild officer) uses the guild channel to communicate across the spatial/gender divide with the male trolls. The other female player who uses the channel does so only to announce her arrival to the group as a whole. Once again, this suggests the possibility that the officers, who control the channel, operate as its owners, while the guild members are the 'users', who enter the space in a relation of clientship.

The exclusion of one player from the out of character event is noteworthy. Although at least one player who attended the event had access to the Hotline channel but not to the guild channel, players only occasionally chose to use the Hotline over the guild channel. Players have thus chosen to construct the event as a guild event, and to highlight their identities as guild members and guild officers. Notably, they have chosen their guild identity at the expense of inclusivity, and exclude one of the participants from a significant portion of the event.

It is possible to explain this by referring to the fact that players, and particularly guild officers, saw particular significance to the guild chat in constructing the identity and character of the guild. About a month before the wedding, the players had gathered for a meeting to discuss how to improve the guild, and their role-playing in particular. While several suggestions concerned ways to improve the guild's focus and organisation of role-playing events, the guild leader (known as the 'Loremaster') also encouraged guild members to participate more in the guild channel. He jokingly referred to the channel as 'spam' or worthless verbiage ['GreenSpam™'], but his comments afterwards suggested the value of the chat in the guild channel – notably as a way of building a communal identity through 'sharing' and enhancing the sense of proximity to other guild members in the game – the channel is a way to bring dispersed guild members 'closer' to one another.

[Zel]: Anyways...if it's quiet in guildchat

[Zel]: MAKE it alive. Share everything with the guild

[Zel]: Don't wait for someone else

[Zel]: SAY something

....

[Zel]: It's what's going to get us closer (unfortunately even to Takal'jin)

Two players, who had both shifted to playing their alternative character most of the time, complained that the Hotline was not used, which made them feel alone and cut off from the guild. In response the guild leader explained his perspective – that the Hotline was not there to undermine the guild's core identity by replacing guild chat:

[Zel]: And quite frankly: [Hotline] was not created so that we could abandon the guild and still be a guild.

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